BE-2520

# SHARP SERVICE MANUAL

CODE:00ZBE2520VSME

## ELECTRONIC AUDIT MACHINE

## MODEL BE-2520

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SHARP CORPORATION



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The contents are subject to change without notice.

# 1.SPECIFICATIONS

## 1-1. General

| | |
|---|---|
| Model name: | BE-2520 |
| Power requirements: | AC220V 50Hz |
| Power consumption: | 38 W |
| Operating temperature: | 0°C ~ 40°C (32° ~ 104°F) |
| Physical dimensions: | 286 (W) x 377 (D) x 135 (H) mm |
| Weight: | Approx. 5 kg (11 lbs.) |
| Memory retention time: | Approx. 1 month<br>Ni-cad rechargeable battery |
| Display unit: | Fluorescent display tube (green) |
| Printer unit: | M-210V 7 x 7 dot matrix |
| Roll paper: | Width: 76±0.5 mm<br>Max. O.D.: 80 mm |
| Ink ribbon: | Width: 13 mm<br>Length: 10 m<br>Color: Violet<br>Type: ERC-P03 |

## 1-2. Reference documents

- Cash Register Basic Manual
- M-210V Printer Service Manual

## 1-3. Internal construction

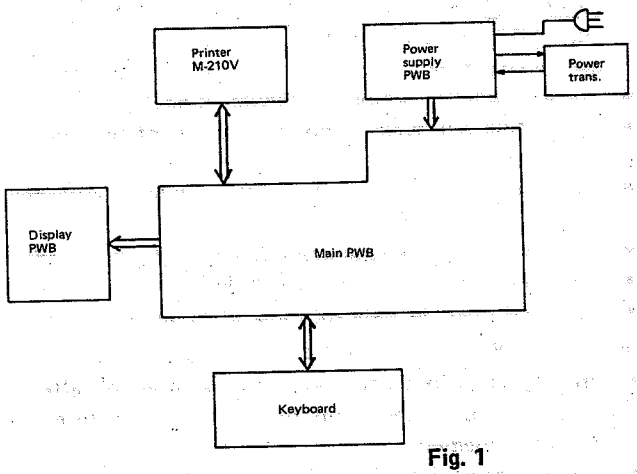
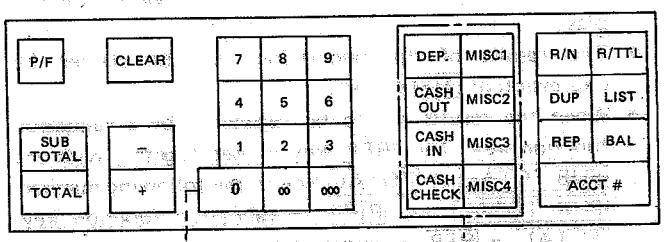



Fig. 1

## 1-4. Keyboard layout

- Standard Keyboard Layout




- Modified Key

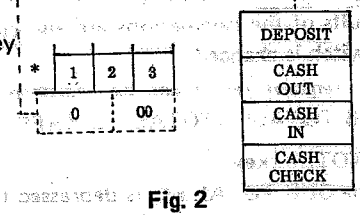



Fig. 2

*Key top layout may be changed. At the same time, key layout select presetting (MRS1) is required.

The keys have the following functions.

(1) [0]–[9], [00], [000] (Numeric keys)

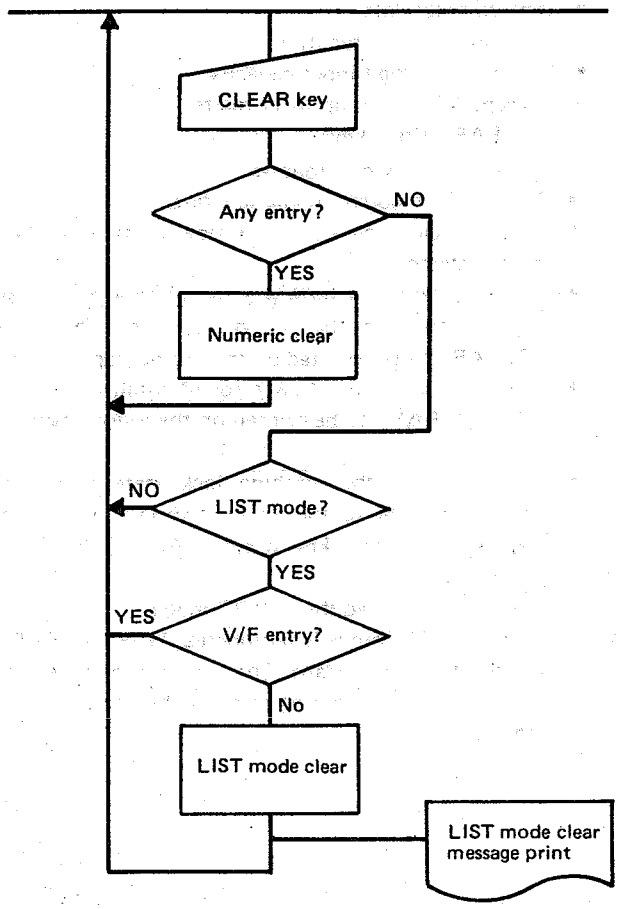
- Used to enter data.
- Two key roll-over function.
- Maximum 10 digit input capacity. (Except ACCT # – up to 11 digits)

(2) [CLEAR] (Clear key)

The clear key is used as follows:

- To clear an incorrect numeric input.
- Used to clear an entry overflow error (too many digits entered).
- Used to clear an overflow error of totalizers caused by an entry from the [+] or [–] key. This causes "CLEAR" to be printed on the journal tape.
- Used to clear an overflow error of totalizers, causing "OVF CLEAR" to be printed on the journal tape.
- Used to clear the machine lock state that is encountered if the balance is negative in "LIST" mode. Depression of this key prints "BAL (–) CL" on the journal tape.
- Used to terminated the "LIST" mode. If the "LIST" mode is terminated, "LIST CLEAR" is printed the journal tape. This key cannot terminate the "LIST" mode during an entry, however. however.

- Used for cancellation of the LIST mode. Message is printed in this case.




(3) [DEPOSIT], [CASH IN], [CASH OUT], [CASH CHECK], [MISC1], [MISC2], [MISC3], and [MISC4].
(Standard 8 items summary) Validation function keys

- When any of these validation function keys is depressed after entering data by the numeric keys, the data is stored in the specific grand totalizer and printed on the slip. The data is further added to the batch totalizer only when this is designated by presetting in advance.
- The consecutive number is counted up as a result of the depression of any of these (function) keys: However, this is determined by the presetting done in advance.
- During resetting (Z mode), the net total is printed with a "+", "−" or with a "non-add" symbol (specified by the presetting).
  (CASH IN TOTAL) − (CASH-OUT TOTAL) − (CASH CHECK TOTAL) = NET TOTAL
- For functions programmed for auto check function "Yes," registered data are sequentially stored in the auto check buffer.
- Storing registration data in the auto check buffer is possible up to lock out point which may be preset at the Initial presetting.
- The balance memory is updated by the data registered in the LIST mode, according to "+", "−", or "NON-ADD" sign given to that validation function key at the time of initialization.

(4) [DUP] (Duplicate key)

- When the duplicate key is pushed immediately after any of the function keys (DEPOSIT, CASH-IN, etc.) has been used, the identical contents of the transaction can be printed on a slip.
- The duplicate key can be operated repeatedly, as many times as has been preset.
- If a duplicate key has been programmed unconditional during initialization, a next operation is not permitted unless the specific key has been operated.
  Note: In this case however, the consecutive No. is not counted up.

(5) [ACCT #] (Account number key)

- Used as an account number key. Depression of the key displays "H" on the 13th digit of the display and the data on display at that time are then printed on the journal.
- Number entry of account number is up to 11-digits maximum.
- Memory is not affected by the use of this key.
- If the machine is programmed for compulsive depression of the [ACCT] # key by the initial setting, it does not allow any registration before this key is pressed. (REG mode alone)
- The conditional requirement for the depression of the [ACCT #] key is cleared after a validation key depression, [R/N] [R/TTL] [BAL] key depression, or mode switch changeover.
- For setting teller number (in "PGM" mode).
- For setting one-cycle or double-cycle printing in preset mode.
- Inputting characters (symbols) that identify customer ID in preset mode.
- To read all preset programmed conditions (in "Z" mode).
- Used to set the print format. (Z mode)
- Used to display the date and time. (BTL mode)

(6) [+], [−] (Plus, minus keys)

- Used to carry out addition and/or subtraction after a numerical input, the result of which will be stored in the buffer memory.
- The numerical data, input by either of these keys, will by printed on the journal paper with either a plus or minus sign. The same data will also appear on the display.
- The results of the calculations will be cleared by depression of [TOTAL] key.
- When the results are to be registered by a validation function key. The [REP] key is used together with the [SUB TOTAL] or [TOTAL] key in the following manner: [SUB TOTAL] → [REP] → validation function key. [TOTAL] → [REP] → validation function key.
- The results of the calculations are also cleared when the mode switch is changed.
- Zero or negative result can be registered by the use of the [SUB TOTAL], [TOTAL], or [REP] key.

(7) [SUB TOTAL] key

- When the SUB TOTAL key is depressed (after operation of the plus/minus keys), the resulting information will be printed and displayed but not cleared.

- Operation of the plus/minus keys can continue even after the SUB TOTAL key has been depressed.
- When the SUB TOTAL key is depressed, the resulting information can be registered in the following manner: "SUB TOTAL" → "REP" → VALIDATION FUNCTION KEY
- Used to display & print the accumulation of calculations registered with the + or − keys.
- If the result of a calculation is positive, the indicator " + " lights, and if negative the indicator " − " will light.
- It is possible to continue computation with + or − keys after depressing the SUB TOTAL key.

(8) TOTAL key

- When the TOTAL key is depressed (after operation of the plus/minus or SUB TOTAL keys), the resulting information will be printed, displayed and cleared from memory.
- To use the total amount with the validation keys use the REP key as follows:
  "TOTAL" → "REP" → VALIDATION FUNCTION KEY

(9) REP (Repeat key)

- This key is used to register another transaction by using the value being displayed obtained by the depression of a validation function key, DUP key, SUB TOTAL key or the TOTAL key.
- For repetition of addtion or subtraction of a displayed amount.
- This key is used to enter a displayed value with a validation function key after the depression of the SUB TOTAL or TOTAL key.
- This key is used to carry out other transactions by use of other validation function keys utilizing a displayed value after depression of a validation function key of duplication through the DUP key.
- This key is used to set the time. (PGM mode)

(10) R/TTL (Read total key)

This key is used to read and/or reset batch and Grand totals with depression of this key.

- The batch totals are read without resetting (in "PGM" mode)
- Batch totals are printed and reset (in "BTL" mode)
- Grand totals are printed and reset (in "Z" mode)

This key can also be used to read or reset the contents of the check buffer memories. For this purpose enter "1" and then depress this key.

- The above operation reads the contents of the check buffer memories (in "REG" mode)
- The above operation prints and resets the contents of the check buffer memories (in "Z" mode)
- Use of the R/TTL key is prohibited in the LIST mode. (Z mode)

(11) R/N (Read net key)

- For computing net total of daliy transactions. The net total appears on the display and prints on the journal.
- For computing the check buffer total, enter "1" and depress this key. The check buffer total appears on the display and prints on the journal ("REG" mode)
- For computing net batch total (in "PGM" mode). The total shows up on the display and prints on the journal.
- Use of the R/N key is prohibited in the LIST mode.

(12) P/F (Paper feed key)

- There are two kinds of paper feed available, a fast paper feed and a normal paper feed.
- Depressing this key once will cause paper to feed (normal) at one line per printer cycle (2.4 lines/second).
- Depressing and holding this key down will cause paper/feed (for the first three lines) at a rate of one line per printer cycle, but then changes speed to the fast paper feed which is about three lines per printer cycle (7.2 line/second).

(13) LIST key

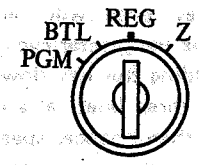
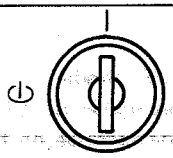
1. Used to assign the LIST mode.
   Depression of this key makes the LIST mode operational, with the LIST mode message on the display and printout.
2. In the LIST mode, the balance memory is updated with the amount registered according to the sign ("+", "−", or NON-ADD) given to the validation function key.
   Register operation in the LIST mode is the same as in normal operation, including validation printout format and accumulator update.
3. The LIST mode is cancelled by the CLEAR key.
   When the LIST mode is cancelled, not only the message is printed on the journal, but also the balance memory is cleared.
4. The capacity of the balance memory is 10 digits including a sign, any entry exceeding this limit is prohibited.
5. Reading and resetting in the LIST mode is prohibited.

(14) BAL key (Balance key)

1. This key is used to display the balance in the LIST mode and to perform validation print.
2. Depression of this key clears the balance memory and the LIST mode is cancelled.
3. If the balance is negative, the machine performs validation printing, encounters the "balance negative error, and enters the machine lock state.
   To release from this condition, it needs to press the CLEAR key, which causes the LIST mode also cancelled.
4. Accumulators are not affected by the depression of the BAL key. The consecutive numbering is not incremented, neither.
5. This key is used to activate the clock function ("Z" mode).
6. This key is used to clear the data holding an account #.

## 1-5. Key switches

Mode Key No.: GZ10

| | Switch layout | Description ○: Allowed X: Not allowed | | | | Remarks |
|---|---|---|---|---|---|---|
| Mode switch |  | Position | Teller key | Master key | Insertion & removal of key | Teller keys are common. Master keys are common. |
| | | PGM | ○ | ○ | ○ | |
| | | BTL | ○ | ○ | X | |
| | | REG | ○ | ○ | ○ | |
| | | Z | X | ○ | X | |
| | | | | | | |
| Power switch |  | Position | Power switch key | | Insertion & removal of key | Power switch key are manufactured in about 300 different kinds. |
| | | ⏻ | ○ | | ○ | |
| | | \| | ○ | | ○ | |

- Power Switch
  - Used to turn machine on or off
    Note: There are about 300 different keys available for this machine.

## 1-6. Mode control switch

(1) REG mode

- Originary transactions are possible.
- Reading the grand totalizer
  When the [R/TTL] key is depressed in this mode, the details of the grand totalizer are printed, but are not cleared from memory.
- Auto check reading
  After pressing the numeral key [1], when the [R/TTL] key is pressed, the details of the check buffer totalizer are printed out, but its contents are not cleared.
  (If the machine is programmed for auto check function "No", it does not allow auto check reading.)

(2) PGM mode

- Setting of teller No.
  The teller No. can be set by entry a 3 digit (or less) number, then, depress [ACCT #] key.

Teller No. 3 digits → [ACCT #]

- A different machine number can be assigned during initialization. (Refer to MRS7) in section 3 initial presetting.
- Reading the batch totalizer
  When the [R/TTL] key is depressed in this mode, the details of the batch totalizer are printed, but are not cleared from memory.
- Setting of date
  The date (month, day, year) can be set by entering a 6-digit number (5-digits in the case of a 1-digit month) then depress the [DUP] key.

Month 2-digits → Day 2-digits → Year 2-digits → [DUP]

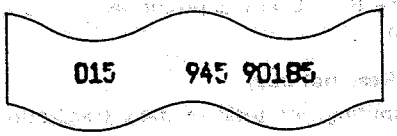
- Setting of time
  When the calender timer function is initialized the date entry format is different according to the setting code 1 through 7. For details of the proper entry procedure, refer to MRS-16 in section 3, Initial Presetting. If the entry has been correct the date is printed on the journal and displayed on the display.
  Enter the hour (one or two digits) and minute (two digits) in this sequence, then press the [REP] key.

Example: Setting the time at 9:45 am

| Step | Key operation | Display |
|---|---|---|
| 1 | 945 | PGM 9.45 |
| 2 | [REP] | PGM 04. 12. 85 09-45 |

When the AM/PM system is selected, "A" or "P" is displayed.

Note: Set the time on the Militaly system. When setting the time at 9:45 pm, enter "2145".
If the time is correctly entered, it is displayed along with the date.
Print on the journal.

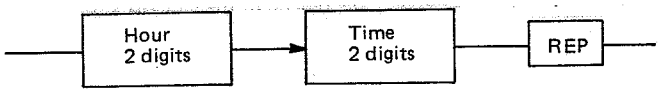


The current time is entered by entering two digits for the hour and two digits for the minute (three digits total, if the hour digit is a single digit) and depressing the [REP] key.
Please note that the 24 hour military system must be used for entry.

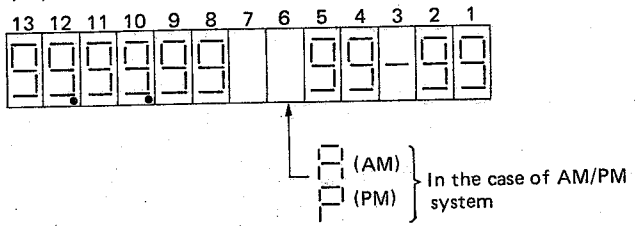
When the calender timer function has been programmed inactive during initial presetting, this operation is prohibited.

If the correct entry is made the time will be printed on the journal, as well as being displayed on the display along with the date.

This display will be cleared upon the next depression of an effective key or the mode switch position is changed.




Display configuration of date and time display




This display will be cleared upon depression of a next effective key or changing of the MODE switch location.

(3) BTL (batch total) mode

- Reading and resetting of batch totalizer when the [R/TTL] key is depressed in this mode, the details of the batch totalizer are printed twice (same format) and are reset (cleared from memory).
- When a validation function key* (DEPOSIT, CASH OUT, CASH IN, CASH CHECK) is depressed in this mode, the contents in the batch totalizer for that function key (i.e. DEPOSIT) are printed, displayed and cleared from memory. *MISC1-MISC4 are also validation function keys.

(4) Z (resetting) mode

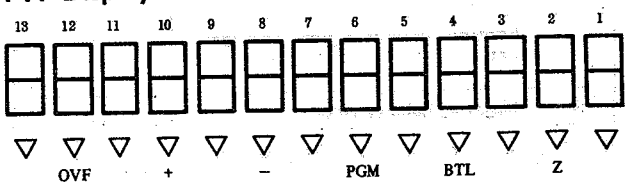
- Reading and resetting of grand totalizer when the [R/TTL] key is depressed in this mode, the details of the grand totalizer are printed twice (same format) and are reset (cleared from memory).
- Presetting (pre-programming) the machine operation is accomplished in the Z mode (master reset mode).
- When the [ACCT #] key is depressed, the preset program is printed out.
- Detail of initialization may not be checked in the list mode.
- Special cancellation
  A transaction in the "REG" mode can be cancelled out by registering the same transaction in the Z mode in this case, the print format will be different.
- But, the list memory is updated in a normal manner.
- Instead of having a "$" as our zero supression symbol, a "C" (position 11) and "−" will be printed out.

Print format

#999C ....., ....., ..... 9.99 ← Print Format 1
#999C ..... ..... ..... 9.99 ← Print Format 2 or 3

- Auto check resetting
  After pressing the numeral key "1", when the "R/TTL" key is pressed, the details of the auto check totalizer are printed out once, and its contents are all cleared. (If the machine is programmed for auto check function "No", it does not allow auto check resetting.)
- List mode
  Used for cancellation of the LIST mode. Message is printed in this case.

## 1-7. Display




Fluorescent display tube (green)

**Fig. 5**

| Item | Column No. | Notes |
|---|---|---|
| ▽ Z | 2 | Lights up in Z mode. |
| ▽ BTL | 4 | Lights up in batch mode. |
| ▽ PGM | 6 | Lights up in program mode. |
| ▽ − | 8 | Lights up when result of addition and subtraction becomes nagative.<br>Lights up when the balance memory is negative when the [BAL] key is depressed. |
| ▽ + | 10 | Lights up when result of addition and subtraction becomes positive.<br>Lights up when the balance memory is positive when the [BAL] key is depressed. |
| ▽ OVF E | 12 (E = 13) | Lights up in the event of an overflow error in the memory (secondary totalizer) |
| E | 13 | Lights up when numerical input exceeds 11 digits.<br>Lights up when primary totalizer is in an overflow error.<br>Lights up when an error is made in an operation. |
| F | 13 | Lights up when the slip is not inserted, when the slip detect function has been programmed active. |
| A | 13 | • Light up, if the machine is programmed for auto check function "Yes," when the number of stored items becomes larger than the warning point programmed at initial setting. (The "slip not inserted" error has priority.)<br>• Goes off when the auto check resetting.<br>• Goes off when a correction is made by special canellation and the stored items goes less than the warning point programmed at initial setting. |
| L | 13 | • Lights up, if the machine is programmed for sentinel amount "Yes," when the grand totalizer net is equal to or larger than the sentinel amount.<br>• Goes off with resetting of the grand totalizer.<br>• Goes off when a correction is made by special cancellation and the grand totalizer net goes less than the sentinel amount. |
| H | 13 | Lights up when the account number retention function has been programmed.<br>Light goes out when the account number is cleared. |
| L | 12 | • Becomes active in the LIST Mode.<br>• Goes out after the cancellation of the LIST mode and by the depression of the BAL key. In the case of the negative balance error, the indicator goes out after cancellation of the error condition. |

## 1-8. Buzzer function

In the event of mis-operation or overflow error, the buzzer will sound. The relationsip between the status display ( ▽ ) and buzzer is shown below.

| Item | Content | OVF ▼ | E | F | | L | ▽ | Buzzer | Remedy |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Mis-operation | | | | | | | One shot | Operate correctly. |
| 2. | Numerical input overflow | | ○ | | | | | Short buzzer | Press CLEAR key. |
| 3. | Overflow of primary totalizer | | ○ | | | | | Short buzzer | Press CLEAR key. |
| 4. | Overflow of secondary totaliser | ○ | ○ | | | | | Short buzzer | Press CLEAR key. |
| 5. | Slip not inserted | | | ○ | | | | Short buzzer | Insert slip. |
| 6. | Number of used auto check buffers<warning point | | | | ○ | | | None | • Perform auto check resetting<br>• Number of used auto check buffers<warning point |
| 7. | Sentinel amount ≦ grand totalizer net | | | | | ○ | | None | • Grand totalizer resetting<br>• Make the sentinel amount larger than the grand totalizer net. |
| 8. | Negative balance error | | ○ | | | | ○ | Short buzzer | Depression of the CLEAR key |

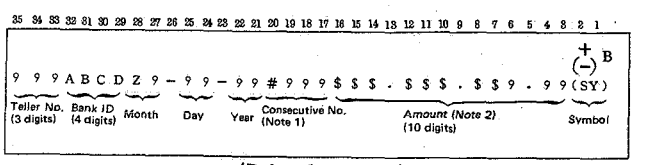
NOTE: Priority of the error state is as follows. 1: H, 2: R, 3: L, 4: E or F

## 1-9. Printer

- Printer specifications

| Item | Standard |
|---|---|
| Type | M-210V |
| Printing method | Serial dot matrix |
| Number of digits | 35 digits |
| Font | 7 x 7 (7 wires) dot matrix |
| Character dimensions | 1.7(W) x 2.9(H) mm |
| Line pitch | 4.23 mm ± 10% |
| Digit pitch | Approx. 1.9 mm |
| Printing speed | Approx. 2.4 lines/second |
| Printer dimensions | 123(W) x 293(D) x 153(H) mm |
| Journal paper roll size | 76 ± 0.5 mm wide x 80 mm OD |
| Thickness of journal paper | 0.07 to 0.09 mm |
| Validation paper | Width: more than 130 mm<br>Thickness: 0.09 to 0.15 mm |
| Ink ribbon | ERC-P03<br>Color: violet<br>Material: nylon<br>Size: 13 mm wide by 10 m long<br>MCBF: 2 million lines |

## 1-10. Slip printout


35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
+ (–) B
9 9 9 A B C D Z 9 – 9 9 – 9 9 # 9 9 9 $ $ $ . $ $ $ . $ $ 9 . 9 9 (SY)
Teller No. (3 digits)
Bank ID (4 digits)
Month
Day
Year
Consecutive No. (Note 1)
Amount (Note 2) (10 digits)
Symbol

**(Print format 1)**

$: zero suppression symbol

Note 1: When the consecutive number is in 4 digits, a number is printed in place of the "#" mark. When DUP key is used, slash marks (/) are printed between month day and day year insteard of (–) marks.
The consecutive number automatically returns to zero (from 9999 to 0000).

Note 2: The zero suppression symbol "$" is a floating symbol, and is printed only once in the highest digit of the amount.

Note 3: "+" or "–B" is printed in the place of a sign, When the balance is printed.

## 1-11. Print format under reading mode (for standard feature)

```
        BATCH  TOTAL  CHECK

111     211 91785          0000X

      0X D                0.00 D
      0XC0                0.00C0
      0XCI                0.00CI
      0XCC                0.00CC
      0XM1                0.00M1
      0XM2                0.00M2
      0XM3                0.00M3
      0XM4                0.00M4
                         -0.00MT
                         +0.00NT
```

```
        GRAND  TOTAL  CHECK

111     210 91785          0000X

      0X D                0.00 D
      0XC0                0.00C0
      0XCI                0.00CI
      0XCC                0.00CC
      0XM1                0.00M1
      0XM2                0.00M2
      0XM3                0.00M3
      0XM4                0.00M4
                         -0.00MT
                         +0.00NT
```

| | | | |
|---|---|---|---|
| 111: | Teller/machine number | D, CO, CI, CC, | |
| 91785: | Date | M1, M2, M3, M4: | Validation function keys |
| 211: | TIME | NT: | Net total |
| 0000X | Reading, number 0 | X: | Reading mode (PGM or REG.) |

## 1-12. Print format under resetting mode (for standard feature)

```
        BATCH  TOTAL CLEAR

111    1052 91885          0002Z

      0Z D                0.00 D
      0ZC0                0.00C0
      0ZCI                0.00CI
      0ZCC                0.00CC
      0ZM1                0.00M1
      0ZM2                0.00M2
      0ZM3                0.00M3
      0ZM4                0.00M4
                         -0.00MT
                         +0.00NT
```

BTL mode

```
        GRAND  TOTAL CLEAR

111    214 91785           0001Z

      0Z D                0.00 D
      0ZC0                0.00C0
      0ZCI                0.00CI
      0ZCC                0.00CC
      0ZM1                0.00M1
      0ZM2                0.00M2
      0ZM3                0.00M3
      0ZM4                0.00M4
                         -0.00MT
                         +0.00NT
```

Z mode

Note: The print formats for the batch and grand totals are printed twice (2X) under the resetting modes.
0018Z: Reset, number 18
0020Z: Reset, number 20

(1) Calculation of the net total is determined by the presetting of the machine.

(2) The reset counter is attached independently to the grand totalizer and batch totalizer. This counter automatically returns to zero (from 9999 to 0000).

(3) In the case of resetting, the first details are printed on the journal, the paper is feed 4 lines, and then the same format is printed again (on journal printing only).

(4) When resetting or reading the batch total, the items of which accumulation into the totalizer is not set by the initial setting are skipped, and not printed.
The net total is not printed if there is an item in which accumulation is not specified but "+" or "−" sign is set.

(5) Four items are printed when the four item mode was designated at the time of initialization.

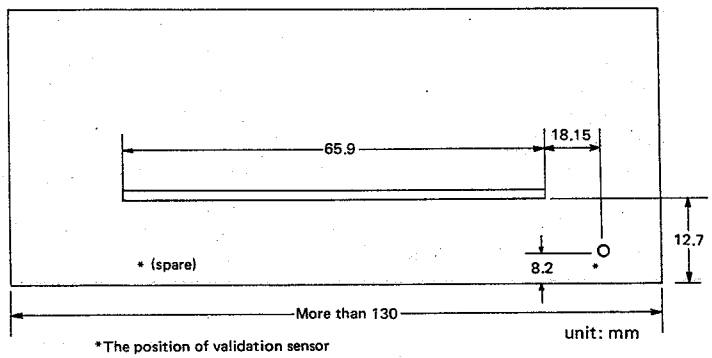
## 1-13. Auto check reading and resetting mode (Slip print)

```
35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

                    ( B A T C H )                                    ( C H E C K )
                    G R A N D     T O T A L                          C L E A R
                                                                                          (X)
9 9 9                   z 9 9 9 z 9 9 9 9 9                                           9 9 9 9 z
                                (MONTH) (DAY) (YEAR)

        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
        z z z 9 Z(S Y)                          z z z , z z z , z z 9 . 9 9(S Y)
                                (-) (-) (-) (-) (-) (-) (-) (-) (-) (-) (-) (-) 9 . 9 9 M T
                                + + + + + + + + + + + +
                                (-) (-) (-) (-) (-) (-) (-) (-) (-) (-) (-) 9 . 9 9 N T
```

Z: Zero suppression
"+" or "−": A single plus or minus sign is printed immediately before the most significant digit of the amount
"Z": A reset sign. In the case of reading, "X" is printed.
"SY": Printed according to the initial setup.
Relation with key is DEPOSIT, CASH OUT, CASH IN, CASH CHECK, MISC1, MISC2, MISC3, and MISC4 from top.
"NT": NET TOTAL
"MT": A minus total sign. It is disregarded and not printed when no negative sign V/F key has not been assigned at the time of initialization.

(1) Net total is computed according to the sigh set the validation function key at the time of initialization.
(2) The reset counter has two totals of grand and batch which operated in the ring method.
(9999 → 0000)

- Slip printing position



## 1-14. Various print formats

### Print Format 1

| Item | Print format |
|---|---|
| Operator no.<br>Date | 9 9 9 Z 9 – 9 9 – 9 9 |
| Validation function | 9 9 9 A B C D Z 9 – 9 9 – 9 9 # 9 9 9 $ $ · $ $ $ · $ $ 9 . 9 9 (s y) |
| NET | 9 9 9 A B C D Z 9 – 9 9 – 9 9 $\overset{+}{(-)}\overset{+}{(-)}\overset{+}{(-)}$ $\overset{+}{(-)}\overset{+}{(-)}\overset{+}{(-)}$ $\overset{+}{(-)}\overset{+}{(-)}\overset{+}{(-)}$ 9 . 9 9 N T |
| a. | Z Z Z Z Z Z Z Z Z Z 9 # |
| b. | Z Z Z · Z Z Z · Z Z 9 . 9 9 $\overset{+}{(-)}$ |
| SUB TOTAL | ★ ★ ★ S U B T O T A L ★ ★ ★ Z Z Z · Z Z Z · Z Z 9 . 9 9 $\overset{+}{(-)}$ |
| TOTAL | ★ ★ ★ T O T A L ★ ★ ★ Z Z Z · Z Z Z · Z Z 9 . 9 9 $\overset{+}{(-)}$ |
| c. | ★ ★ ★ C L E A R ★ ★ ★ |
| d. | ★ ★ ★ O V F C L E A R ★ ★ ★ |
| e. | 9 9 9 A B C D Z 9 – 9 9 – 9 9 # 9 9 9 C – – – – – – – – – – 9 . 9 9 (s y) |
| f. | 9 9 9 A B C D Z 9 – 9 9 – 9 9 # B T L $ $ $ · $ $ $ · $ $ 9 . 9 9 (s y) |
| g. | 9 9 9 A B C D Z 9 / 9 9 / 9 9 # 9 9 9 D $ $ · $ $ $ · $ $ 9 . 9 9 (s y) |
| h. | 9 9 9 A B C D Z 9 – 9 9 – 9 9 # 9 9 9 (C) (s y) |
| i. | Z Z 9 X Z Z · Z Z Z · Z Z Z · Z Z 9 . 9 9 T L |
| j. | ★ ★ ★ L I S T ★ ★ ★ |
| k. | ★ ★ ★ L I S T C L E A R ★ ★ ★ |
| l. | 9 9 9 A B C D Z 9 – 9 9 – 9 9 # 9 9 9 $ $ $ , $ $ $ , $ $ 9 , 9 9 $\overset{+}{(-)}$ B |
| m. | ★ ★ ★ B A L ( – ) C L ★ ★ ★ |
| n. | ★ ★ ★ A C C T # C L E A R ★ ★ ★ |
| o. | 9 9 9 A B C D Z 9 / 9 9 / 9 9 # 9 9 9 V – – – – – – – – – – 9 . 9 9 (S Y) |

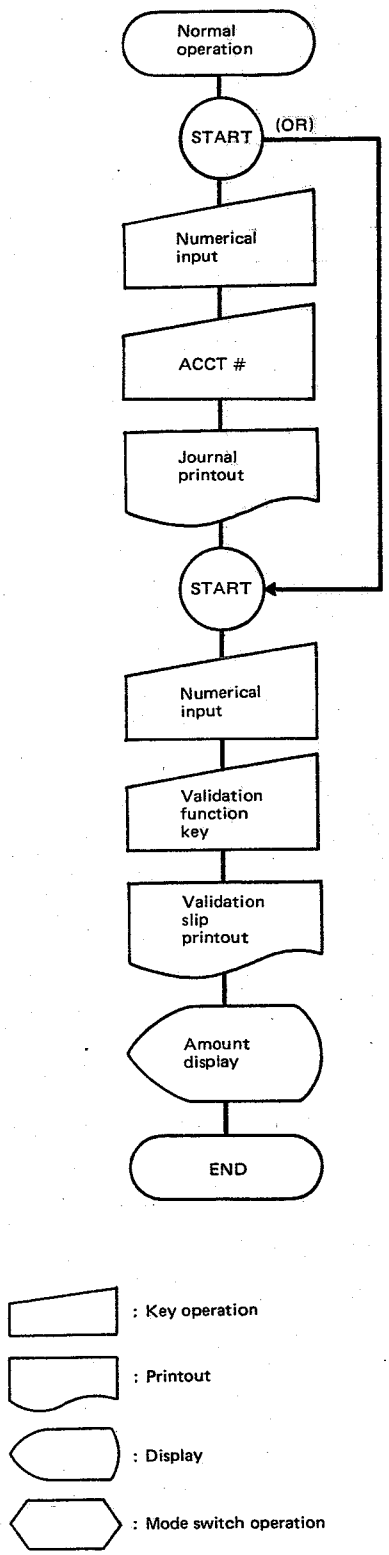
## Print Format 2 or 3

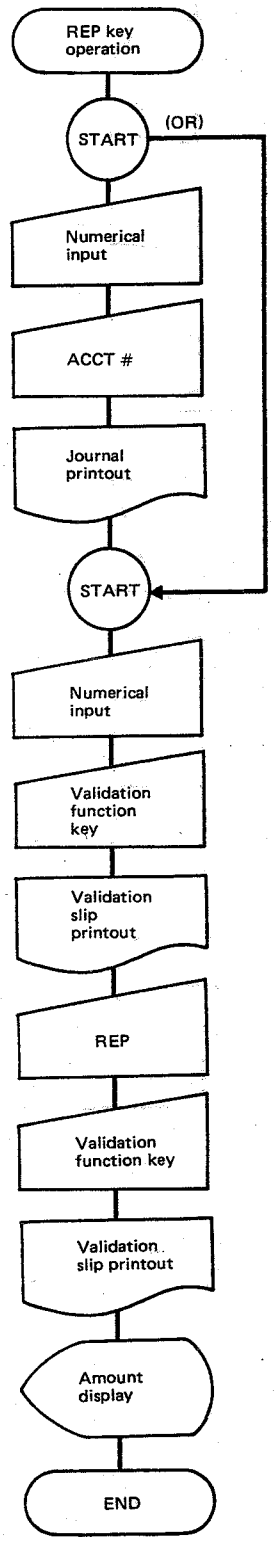
| Item | Print format |
|---|---|
| Operator no.<br>Date | 9 9 9 T T T T Z 9 9 9 9 9 |
| Validation function | 9 9 9 A B C D T T T T Z 9 9 9 9 9 # 9 9 9 $ $ $ $ $ $ $ 9 . 9 9 (SY) |
| NET | 9 9 9 A B C D T T T T Z 9 9 9 9 9 $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ $\overset{+}{(-)}$ 9 . 9 9 N T |
| a. | Z Z Z Z Z Z Z Z Z 9 # |
| b. | Z Z Z Z Z Z Z 9 . 9 9 $\overset{+}{(-)}$ |
| SUB TOTAL | * * * S U B T O T A L * * * Z Z Z Z Z Z Z 9 . 9 9 $\overset{+}{(-)}$ |
| TOTAL | * * * T O T A L * * * Z Z Z Z Z Z Z 9 . 9 9 $\overset{+}{(-)}$ |
| c. | * * * C L E A R * * * |
| d. | * * * O V F C L E A R * * * |
| e. | 9 9 9 A B C D T T T T Z 9 9 9 9 9 # 9 9 9 C – – – – – – – 9 . 9 9 (SY) |
| f. | 9 9 9 A B C D T T T T Z 9 9 9 9 9 # B T L $ $ $ $ $ $ $ 9 . 9 9 (SY) |
| g. | 9 9 9 A B C D T T T T Z 9 9 9 9 9 # 9 9 9 D $ $ $ $ $ $ $ 9 . 9 9 (SY) |
| h. | 9 9 9 A B C D T T T T Z 9 9 9 9 9 # 9 9 9 (C) (SY) |
| i. | Z Z 9 X Z Z Z Z Z Z Z Z Z 9 . 9 9 T L |
| j. | * * * L I S T * * * |
| k. | * * * L I S T C L E A R * * * |
| l. | 9 9 9 A B C D T T T T Z 9 9 9 9 9 # 9 9 9 $ $ $ $ $ $ $ 9 . 9 9 $\overset{+}{(-)}$ B |
| m. | * * * B A L ( – ) C L * * * |
| n. | * * * A C C T # C L E A R * * * |
| o. | 9 9 9 A B C D T T T T Z 9 9 9 9 9 V – – – – – – – – – – – 9 . 9 9 (SY) |

Notes:
- a. : Account no.
- b. : Addition/subtraction
- c. : Addition/subtraction memory overflow lock clearance
- d. : Main memory's overflow lock clearance
- e. : Reversing entry after the completion of transaction
- f. : Batch total
- g. : Duplicate
- h. : Validation function (amount-suppressed validation printing)
- i. : Net total of check buffer memories
- j. : "LIST" mode entry message
- k. : "LIST" mode exit message
- l. : Balance
- m. : Machine lock clear when the balance is negative
- n. : Account number clear message
- o. : Special-void duplication

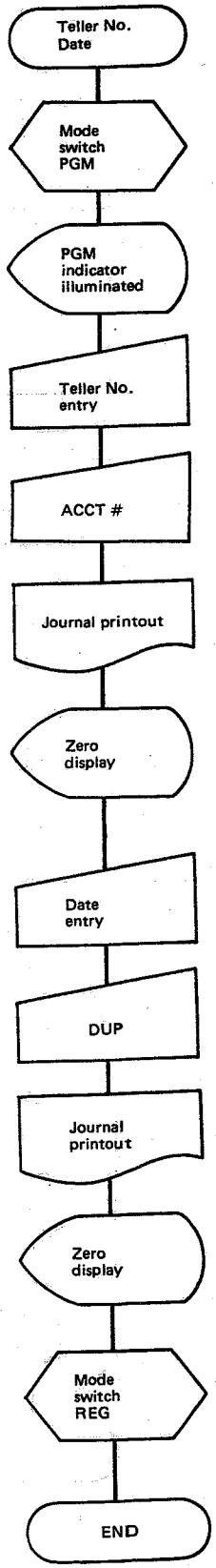
## 1-15. Basic operation flow charts

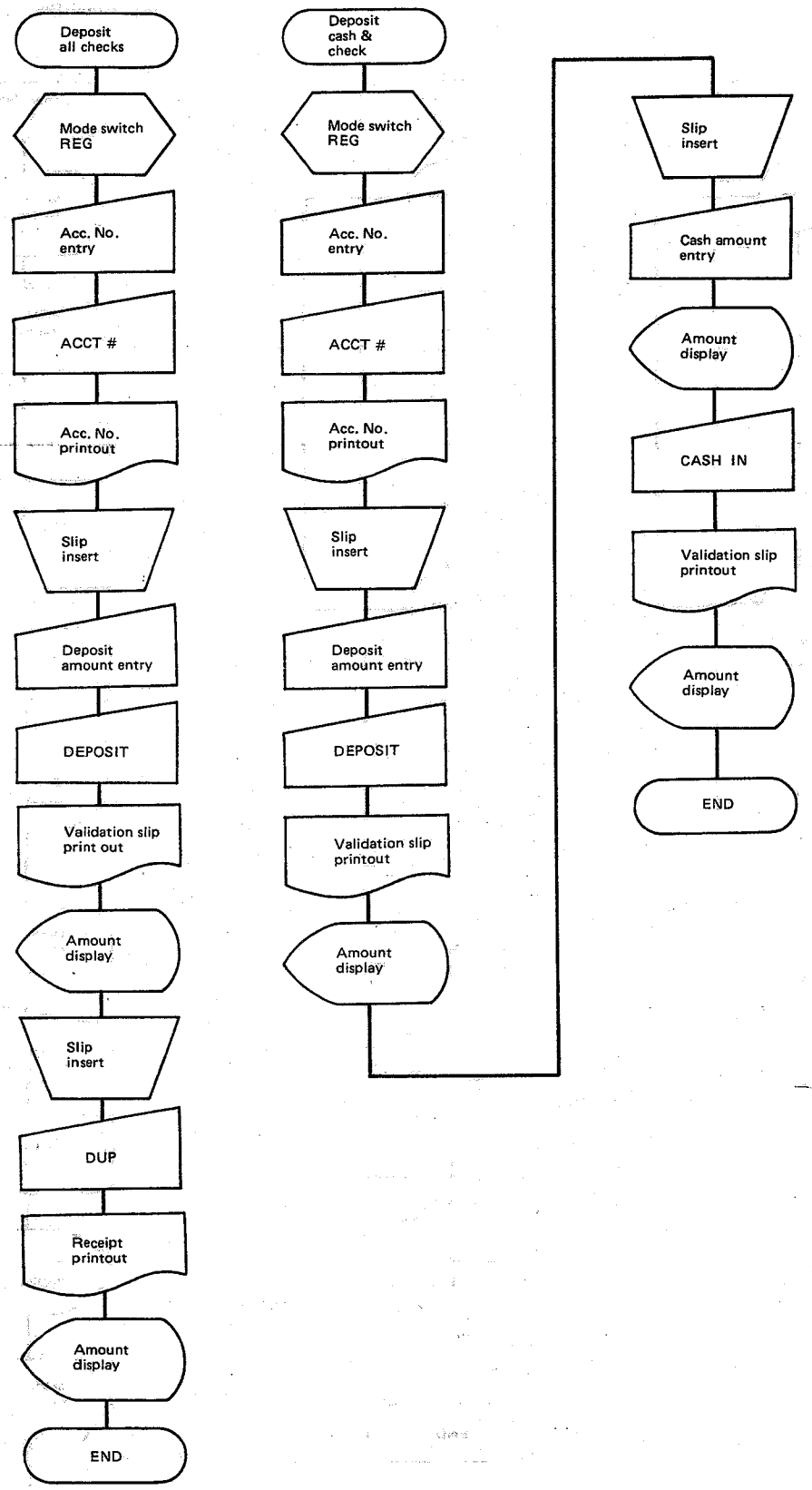
(1) Basic operation

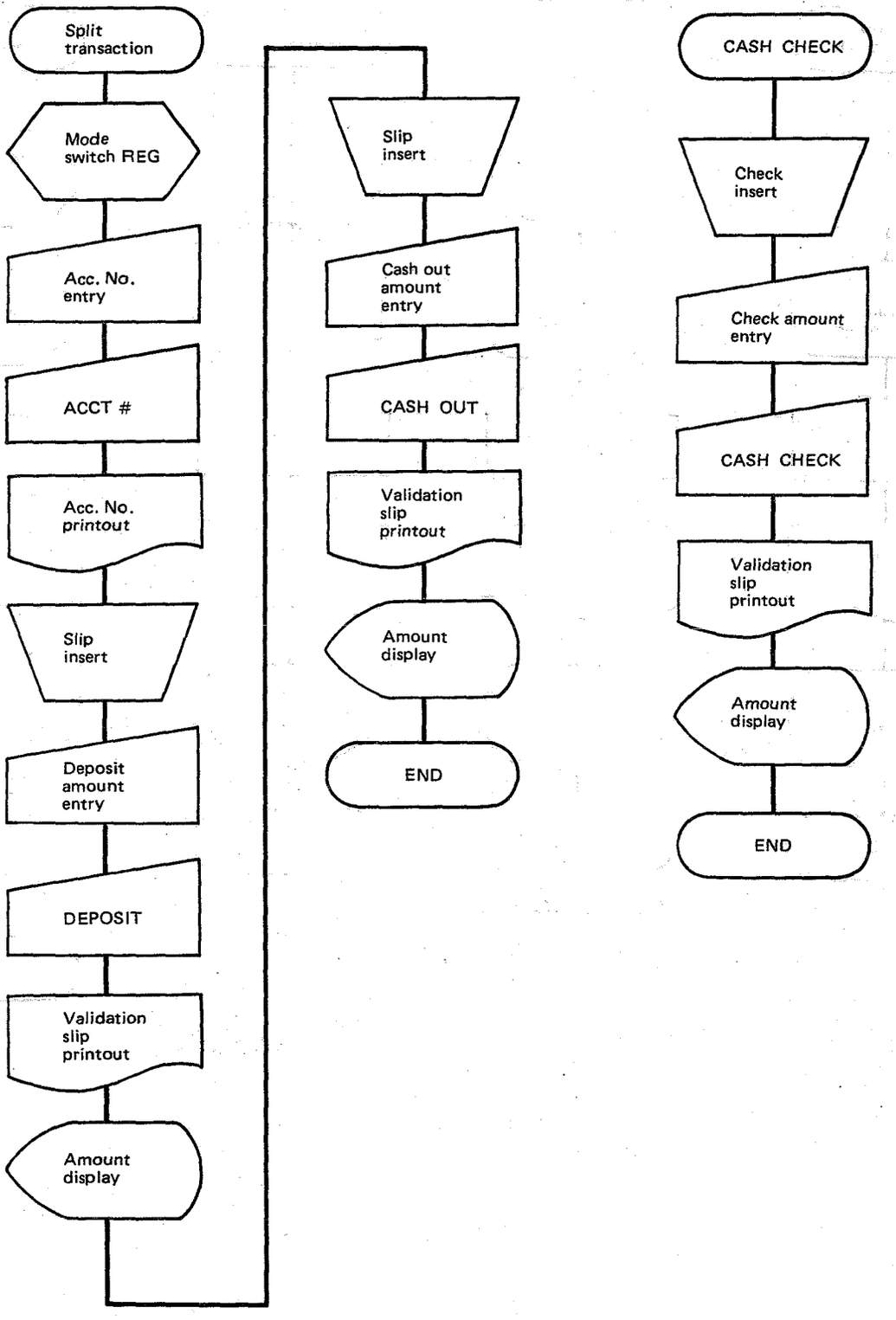


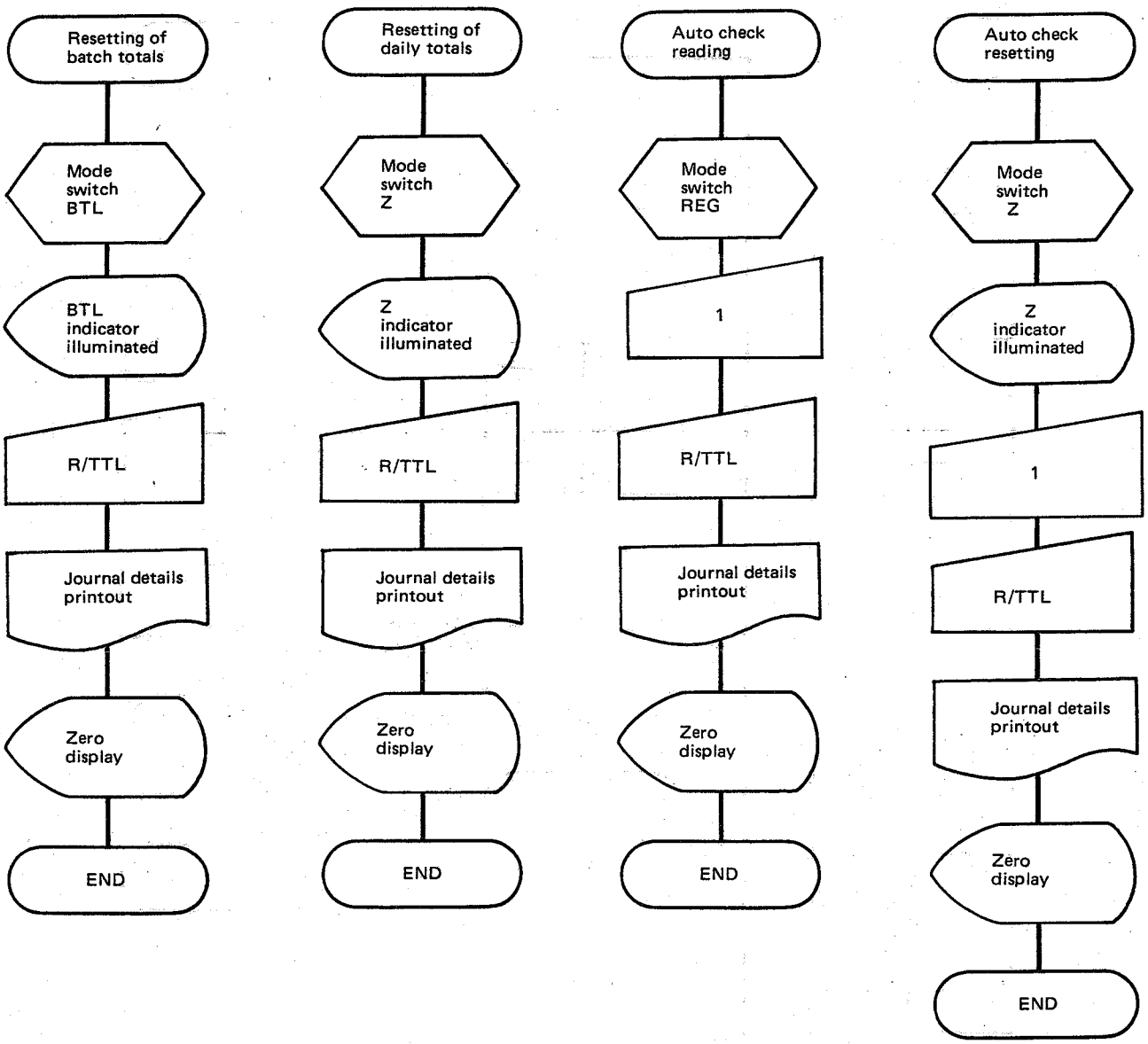



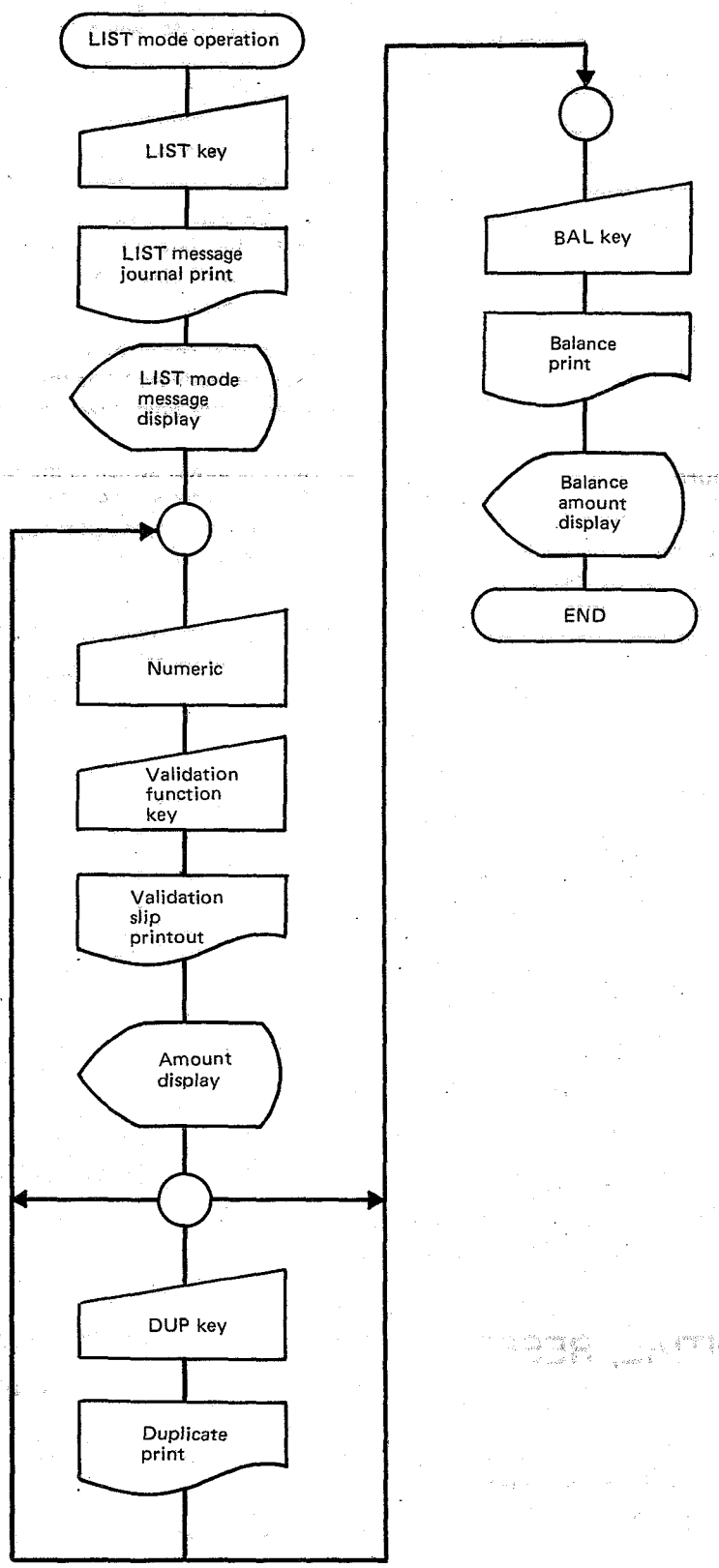

(2) Example of operation




Deposit all checks
Mode switch REG
Acc. No. entry
ACCT #
Acc. No. printout
Slip insert
Deposit amount entry
DEPOSIT
Validation slip print out
Amount display
Slip insert
DUP
Receipt printout
Amount display
END
Deposit cash & check
Mode switch REG
Acc. No. entry
ACCT #
Acc. No. printout
Slip insert
Deposit amount entry
DEPOSIT
Validation slip printout
Amount display
Slip insert
Cash amount entry
Amount display
CASH IN
Validation slip printout
Amount display
END


Split transaction
Mode switch REG
Acc. No. entry
ACCT #
Acc. No. printout
Slip insert
Deposit amount entry
DEPOSIT
Validation slip printout
Amount display
Slip insert
Cash out amount entry
CASH OUT
Validation slip printout
Amount display
END
CASH CHECK
Check insert
Check amount entry
CASH CHECK
Validation slip printout
Amount display
END


Resetting of batch totals
Mode switch BTL
BTL indicator illuminated
R/TTL
Journal details printout
Zero display
END
Resetting of daily totals
Mode switch Z
Z indicator illuminated
R/TTL
Journal details printout
Zero display
END
Auto check reading
Mode switch REG
1
R/TTL
Journal details printout
Zero display
END
Auto check resetting
Mode switch Z
Z indicator illuminated
1
R/TTL
Journal details printout
Zero display
END


LIST mode operation
LIST key
LIST message journal print
LIST mode message display
Numeric
Validation function key
Validation slip printout
Amount display
DUP key
Duplicate print
BAL key
Balance print
Balance amount display
END

### 1-16. Paper jam condition

Once the print paper happens to be jammed in the printer, the machine will discontinue generation of the timing signal (TS) due to interrupted print head reciprocating motion and waits for the power switch to be turned off after indicating the following message of the display, assuming that a paper jam condition has occurred in the printer. Thereby, it will be necessary to turn the power switch off before resuming any key input once the machine has gone into paper jam state.

Display of paper jamming condition:

Digit →13 12 11 10 9 8 7 6 5 4 3 2 1

▼ ▼ ▼ 30.25

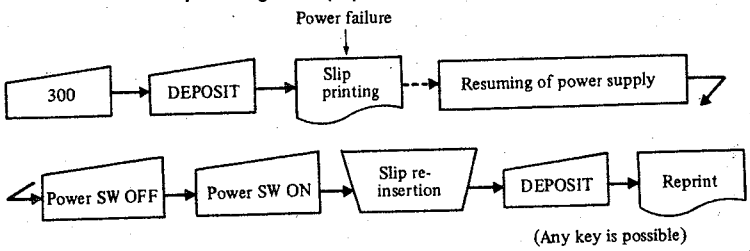
Paper jamming display Any number

### 1-17. Process with power failure

(1) If a power failure occurs during printing (except for the RESET (Z) mode), the power-failure mark (-----) is printed at a line where the set has stopped or at the next line, after the power supply resumes. Then the preceding information (assued at that turn-off time) is printed again at the line next to the power failure marks.

(2) If a power failure occurs during resetting, it will start from the stopped position after resuming power. The power-failure marks is printed the same as (1).

(3) If power is interrupted during printing of a slip and discovered, the machine will go into a paper jam state. In such an event it will be necessary to observe the following procedure after resumption of the power in order to restart printing on a paper.




(4) For operations other than printing, if there is a power failure, again it will start from the once-stopped position after resumption of power.

# 2. MANUAL (INITIAL) RESET

### 2-1. Program reset

This operation is used during a program loop or lockup condition. By performing this operation, the machine should be able to resume normal operation.

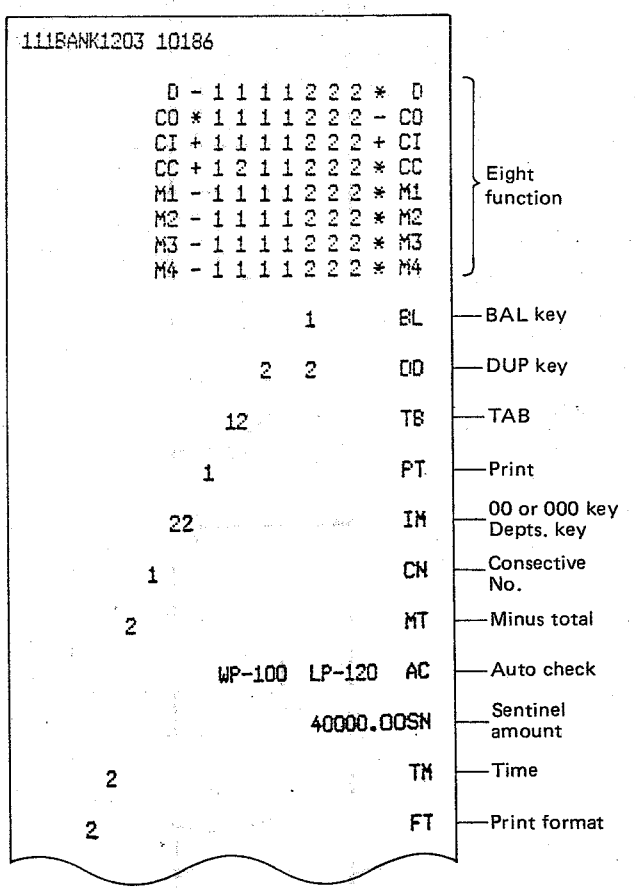
1. Turn power switch to "OFF"
2. Turn the mode switch to the "Z" position.
3. Depress and hold down the "0" key and the "+" key.
4. Turn the power switch to the "ON" position.
   Note: The display should show zeroes (00 ..... 0) in all position.
5. Release the "0" and the "+" keys.
6. Turn mode switch to "REG" position.

### 2-2. Master reset (All memories clear)

Note: By performing this operation, all memory contained in the RAMs will be cleared. It will be necessary to re-program (preset in the PGM mode) prior to operation of machine.

1. Turn power switch to "OFF".
2. Turn the mode switch to the "Z" position.
3. Depress and hold down the "000" key and the "_" key.
4. Turn the power switch to the "ON" position.
5. Release the "000" and "_" keys.
   Note: The display should show zeroes (00 ..... 0) in all positions.
6. Turn power switch to "OFF".
7. Turn the mode switch to the "Z" position.
8. Depress and hold down the "0" key and the "ACCT#" key.
9. Turn the power switch to the "ON" position.
10. Release the "0" and "ACCT#" key.
11. Entry the "2", "2", "ACCT#" key.
    [2] → [2] → [ACCT#]
12. Turn the mode switch to the "REG" position.

After the Master Reset operation, the following read out should be seen for the initial presetting contents:


111BANK1203 10186
0 - 1 1 1 1 2 2 2 * 0
CO * 1 1 1 1 2 2 2 - CO
CI + 1 1 1 1 2 2 2 + CI
CC + 1 2 1 1 2 2 2 * CC
M1 - 1 1 1 1 2 2 2 * M1
M2 - 1 1 1 1 2 2 2 * M2
M3 - 1 1 1 1 2 2 2 * M3
M4 - 1 1 1 1 2 2 2 * M4
Eight function
1 BL
BAL key
2 2 DD
DUP key
12 TB
TAB
1 PT
Print
22 IN
00 or 000 key Depts. key
1 CN
Consective No.
2 MT
Minus total
WP-100 LP-120 AC
Auto check
40000.00SN
Sentinel amount
2 TM
Time
2 FT
Print format

# 3. INITIAL PRESETTING

## 3-1. (MRS1) Selection of four or eight validation function keys and the "00" key or "00" and "000" keys

- Please the power switch to "OFF".
- Set the mode switch to "Z" position.
- Pressing the numeral key "0" and the "ACCT #" key at the same time, turn on the power switch.
- Make sure the display is filled with zeroes, then release the keys.
- Press numeral keys to enter two codes according to the tables below, then press the "ACCT #" key.

1st entry code

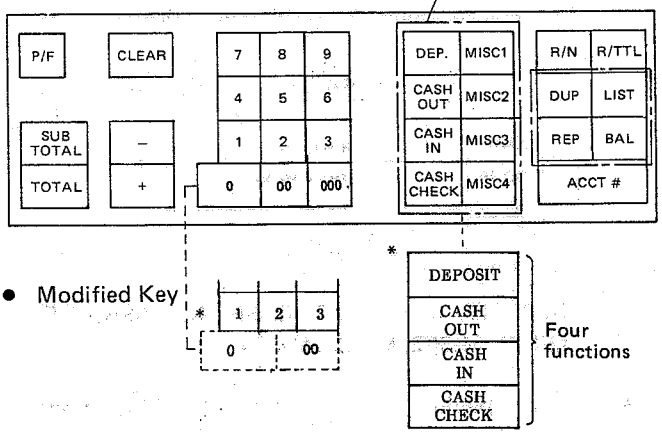
| Setting code | Remarks |
|---|---|
| 1 | This selects four functions. |
| 2 | This selects eight functions. |

2nd entry code (normally "2")

| Setting code | Remarsk |
|---|---|
| 1 | This selects the "00" key. |
| 2 | This selects the "00" and "000" keys. |

Code entry (2 digits) → ACCT #

- Standard Keyboard Layout




- Modified Key




- Make sure the entered codes are printed on the journal, then turn the mode switch back to "REG" position.

## 3-2. (MRS2) Setting of bank ID and validation function key codes and Duplicate print codes

- Turn power switch to "OFF".
- Set mode switch to "Z" position.
- Depress and hold down numeric key [1] and [ACCT #].
- Turn power switch to "ON".
  Make sure the display is filled with zeroes.
- Release the [1] and [ACCT #] keys.

(1) Bank ID

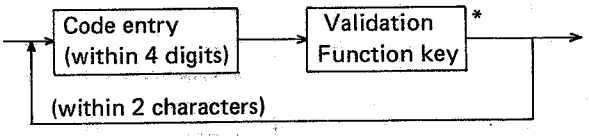
- With reference to the character code table, input the appropriate codes, within 8-digits (4 characters max.) for the desired bank ID description.
- Depress the [ACCT #] key.

Code setting (within 8-digits) → ACCT #

(within 4 characters)

(2) Validation fuction key code

- Input numeric code (character code table) within 4 digits (within 2 characters).
- Depress appropriate validation function key.



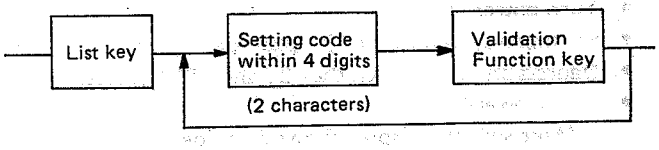

* Validation function keys: DEPOSIT, CASH OUT, CASH IN, CASH CHECK, MISC1, MISC2, MISC3, MISC4.

(3) Setting of the Duplicate print codes

- Press the [LIST] key
- Upon depression of the list key the machine goes into the duplicate print symbol setting mode and a " 0 " is displayed on the 13th digit of the display.
- In reference to Fig.1, enter on the keyboard the appropriate character codes for up to two seperate characters (actually four seperate key stroke entries), an example is given below:

| [KEYSTROKE] | [CHARACTER] |
|---|---|
| 1 & SUB TOTAL | d |

- Press the validation function key that corresponds to the code.




- After completion of entering the validation code and depression of the validation function key, press the [LIST] key. With this, the control returns to the validation function key code setting mode (MRS2-6) and "0" on the 13th digit of the display disappears.

- After completion of this presetting operation, return the mode switch to "REG" position.

Note: If the [DUP] key is depress without a numeric input. The following codes will be set:

| | | | |
|---|---|---|---|
| Bank ID | : not printed | | |
| Deposit | : D | MISC1 | : M1 |
| Cash out | : CO | MISC2 | : M2 |
| Cash in | : CI | MISC3 | : M3 |
| Cash check | : CC | MISC4 | : M4 |

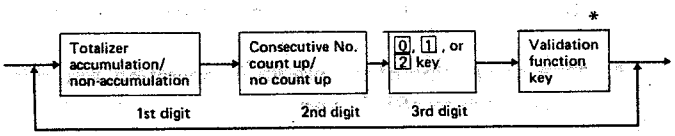
CHARACTER CODE TABLE Fig-1

| Keys | Character | Keys | Character |
|---|---|---|---|
| 1, 00 | a | 4, 0 | @ |
| 1, + | b | 4, 1 | A |
| 1, – | c | 4, 2 | B |
| 1, SUB TOTAL | d | 4, 3 | C |
| 1, TOTAL | ( | 4, 4 | D |
| 1, REP | ) | 4, 5 | E |
| 2, 0 | Space | 4, 6 | F |
| 2, 1 | ' | 4, 7 | G |
| 2, 2 | " | 4, 8 | H |
| 2, 3 | # | 4, 9 | I |
| 2, 4 | $ | 4, 00 | J |
| 2, 5 | % | 4, + | K |
| 2, 6 | ¥ | 4, – | L |
| 2, 00 | * | 4, SUB TOTAL | M |
| 2, + | + | 4, TOTAL | N |
| 2, – | ' | 4, REP | O |
| 2, SUB TOTAL | – | 5, 0 | P |
| 2, TOTAL | ' | 5, 1 | Q |
| 2, REP | / | 5, 2 | R |
| 3, 0 | 0 | 5, 3 | S |
| 3, 1 | 1 | 5, 4 | T |
| 3, 2 | 2 | 5, 5 | U |
| 3, 3 | 3 | 5, 6 | V |
| 3, 4 | 4 | 5, 7 | W |
| 3, 5 | 5 | 5, 8 | X |
| 3, 6 | 6 | 5, 9 | Y |
| 3, 7 | 7 | 5, 00 | Z |
| 3, 8 | 8 | 1, 5 | • |
| 3, 9 | 9 | | |

## 3-3. (MRS3) Setting of validation function keys

This operation is for presetting of the +, –, and non-add symbols, consecutive number count up/no count up and accumulation/no accumulation for the validation function keys.

- Turn power "OFF".
- Set mode switch to the "Z" position.
- Depress and hold down the [2] and [REP] keys.
- Turn power "ON".
  – Make sure the display shows all zeroes.
- Release the [2] and [REP] keys.
- Input a 3 digit code for validation function key operation.
- Depress appropriate validation function key.




Example: If we wanted the [DEPOSIT] key to:
1) Be accumulated in totalizer
2) Have consecutive no. count up
3) Be added to the net total.
The following input code will be used:
[2] [2] [0] → [DEPOSIT]

* Validation function keys: DEPOSIT, CASH OUT, CASH IN, CASH CHECK, MISC1, MISC2, MISC3, MISC4.

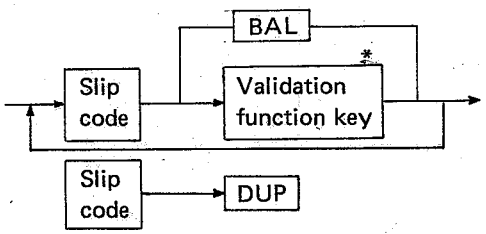
Code setting for validation function key operation.

| Code position | Operation affected | Function desired | Key entry |
|---|---|---|---|
| 1st digit | Batch totalizer | Accumulation | 2 |
| | | Non-accumulation | 1 |
| 2nd digit | Consecutive number | Count up | 2 |
| | | No count up | 1 |
| 3rd digit | Calculation of net-total | + (Added to net-total) | 0 |
| | | – (Subtracted from net-total) | 1 |
| | | Non-add (does not affect net-total) | 2 |

## 3-4. (MRS4) Compulsory slip sensor (Slip detect activation)

- Turn power off
- Turn mode switch to "Z" position
- Depress and hold down the [3] and [DUP] keys
- Turn power on
  – Make sure display has all zeroes
- Input a 1 digit code for compulsory or non-compulsory slip sensor operation
- Depress a validation function key
- Depression of the [DUP] key will also cause activation of compulsory or non-compulsory slip sensor operation.
- Press in sequence of the validation function key, DUP key, and BAL key.

[2]: For compulsory slip sensor, depress [2] key.
[1]: For non-compulsory slip sensor, depress [1] key.




* DEPOSIT, CASH OUT, CASH IN, CASH CHECK, MISC1, MISC2, MISC3, MISC4.

- After completion of this preset, turn to "REG" mode.

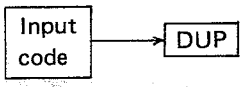
Note: If a particular validation function key slip detect programming has been enabled by the above programming step, the depression of that respective validation key will not be accepted unless a slip has been inserted prior to the key depression.

## 3-5. (MRS5) Limit usage of DUP key with compulsory/non compulsory operation

This preset is for limiting the amount of times the duplicate key can be used.

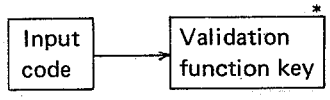
- Power off
- Mode switch to "Z" position
- Depress and hold the [4] and [CASH CHECK] keys
- Power on
  – Make sure display reads all zeroes

(1) • Input a numeric number (from 1 to 9) for the amount of times the [DUP] key can be used.
• Depress [DUP] key




Note: An input code of the number 10 will make [DUP] key usage limitless

(2) • Input a numeric code for compulsory/non-compulsory duplicate.
– For compulsory duplicate, depress [2] key
– For non-compulsory duplicate, depress [1] key
• Depress validation function key




* DEPOSIT, CASH OUT, CASH IN, CASH CHECK, MISC1, MISC2, MISC3, MISC4.

• Return the mode switch to the "REG" position.

## 3-6. (MRS6) Changing of TAB and zero suppression symbol

- Turn power OFF.
- Set mode switch to "Z" mode.
- Depress and hold the [5] and [CASH IN] keys
- Turn power on
  – Make sure the display is filled with zeros
- Release keys
- Input a two digit code for the following

– 1st entry ditit

| Set code | Validation print zero suppression symbol (printed in the highest place) |
|---|---|
| 1 | $ |
| 2 | * |

– 2nd entry digit

| Set code | TAB | Display | Printout |
|---|---|---|---|
| 0 | TAB 0 | 0 | 0 |
| 1 | TAB 1 | 0.0 | 0.0 |
| 2 | TAB 2 | 0.00 | 0.00 |
| 3 | TAB 3 | 0.000 | 0.000 |

- Depress the [ACCT #] key
- Return the mode switch to the "REG" position.

## 3-7. (MRS7) Preset teller and/or machine number

- Turn power OFF.
- Set mode switch to "Z" position
- Depress and hold down the [6] and [CASH OUT] keys
- Turn power on
  – Make sure display shows all zeroes.
- Input a 4 digit code (According to the following chart) for the application desired.

| Set code | Application |
|---|---|
| T/No.<br>1 X X X | In PGM mode, teller No. (in 3 digits) can be set arbitrarily. |
| M/No. T/No.<br>2 (X) X X | The upper 1 digit is fixed as machine No.; the lower 2 digits can be arbitrarily set as teller No. in PGM mode. |
| M/No. T/No.<br>3 (X X) X | The upper 2 digits are fixed as machine No.; the lower 1 digit can be arbitrarily set as teller No. in PGM mode. |
| M/No.<br>4 (X X X) | The 3 digits are fixed as machine No. |

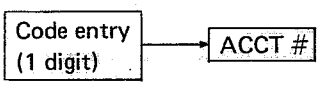
- Depress the [ACCT #] key
- Return mode switch to REG position.

## 3-8. (MRS8) Single or double cycle printing

Single cycle printing:
Using pressure-sensitive paper as the journal paper, the operation is completed by one printing of validation into the slip.
Double cycle printing:
Using ordinary paper as the journal paper, the same information is printed into the journal automatically by pulling out the slip after printing the validation into the slip.
(This is effective only when the light sensor is built in.)

- Turn power OFF.
- Set mode switch to "Z" position.
- Depress and hold the [7] and [DEPOSTIT] keys
- Turn power on.
  – Make sure display shows all zeroes
- Release keys
- Input a one digit code (using the following chart) for the desired application.

| Set code | Application |
|---|---|
| 1 | One cycle printing |
| 2 | Double cycle printing |




- Depress the [ACCT #] key
- Return mode switch to "REG" position

## 3-9. (MRS9) Setting the reset counter to zero

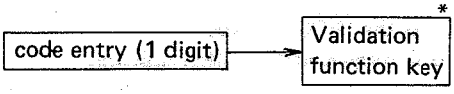
- Turn power OFF.
- Turn mode switch to "Z" position
- Depress and hold down the [8] and [TOTAL] keys
- Turn power on
  – Make sure display shows all zeroes
- Release keys
- Return mode switch to "REG" position

## 3-10. (MRS10) Selection of amount print "Yes" or "No" in validation printing

- Turn power OFF.
- Set the mode switch to "Z" position.
- While pressing the numeral key [9] and [SUB-TOTAL] key at the same time, turn on the power switch.

- Make sure the display is filled with zeroes, then release the keys.
- Press a numeral key to enter either of the following codes, then press a validation function key* (DEPOSIT, CASH OUT, CASH IN, CASH CHECK, MISC1, MISC2, MISC3, MISC4).

| Setting code | Remarks |
|---|---|
| 1 | Full validation print including the amount |
| 2 | Validation print with the amount not printed |




- Make sure the entered code is printed on the journal, then turn the mode switch back to "REG" position.

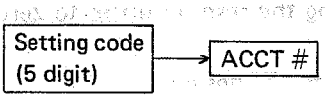
Notes: 1. If the DUP key is used, the printing format depends upon how each validation function key is set.
2. If the machine is programmed for double cycle printing, the printout on the journal occurs in such a format that no amount is printed.
3. When the totalizers are updated, the amount is not updated, but the number of times alone is updated.

## 3-11. (MRS11) Selection of resettable or non-resettable consecutive number

- Turn power OFF.
- Set the mode switch to "Z" position.
- While pressing the numeral key 0 and CASH CHECK key at the same time, turn on the power switch.
- Make sure the display is filled with zeroes, the release the keys.
- Press a numeral key to enter either of the following two codes, then press the ACCT # key.

| Setting code | Remarks |
|---|---|
| 1 X X X X | Resettable consecutive number |
| 2 X X X X | Non-resetable consecutive number |

Note. X X X X: Lower 4-digit of setting code is a predetermined consecutive number.




- Make sure the entered code is printed on the journal, then turn the mode switch back to "REG" position.

Note: The consecutive numbers is to be reset with the following resetting operation if the machine is programmed for resettable consecutive number.
- Batch totalizer resetting
- Down totalizer resetting

## 3-12. (MRS-12) Validation function total print enabling/disabling for a negative result. Programming of a list balance operational symbol.

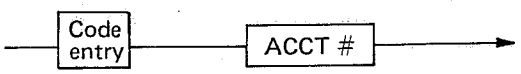
**A. Validation function total print enabling/disabling for a negative result.**

PROCEDURE:
1. Turn the power switch off.
2. Set the mode switch to the Z position.
3. While depressing the numeric key 1 together with the CASH-IN key, turn power on.
4. Release the keys after confirming that the display is showing all zero's.

ENTRY OF PARAMETERS:
1. Enter the appropriate entry code as follows:

| TOTAL PRINT | KEY ENTRY |
|---|---|
| ENABLE | 1 |
| DISABLE | 2 |

2. Press the Account # key after completion of entering the entry code:



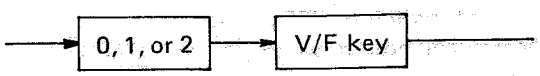

(1 digit)

3. Set the mode switch to the REG position after confirming that a printout has been performed on the journal.

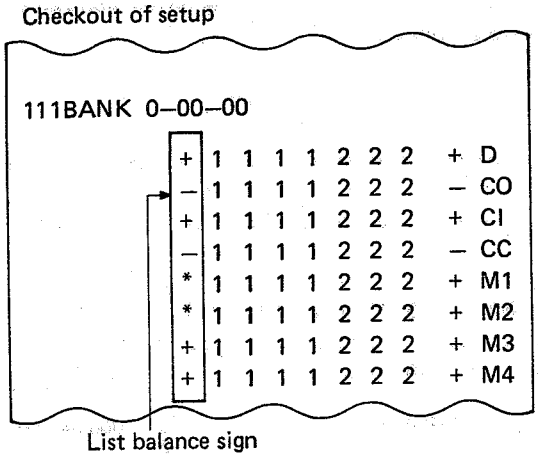
**B. Programming of a list balance operational symbol (LIST BALANCE SIGNS) (+, −, non-add)**

PROCEDURE:
1. Turn power off.
2. Set the mode switch to the " Z " position.
3. Push the 1 and the CASH-IN keys at the same time, then turn the power switch from off to on.
4. Press the 0, 1, or 2 key to select the function followed by the appropriate V/F key as follows:

| Sign | Entry data |
|---|---|
| + | 0 |
| − | 1 |
| * (NON ADD) | 2 |



Checkout of setup




## 3-13. (MRS13) Selection of compulsive or non-compulsive depression of the ACCT # key registrations and keep the account number presetting

Programming validation function keys for compulsive account number entry Yes/No and account number holding Yes/No

If a validation function key is programmed for compulsive account number entry, an amount entry for this key is not allowed unless an account number is entried.

(1) Set the mode switch to "Z" position (Power switch off)
(2) Depress numeric key [2] and [CASH OUT] key at the same time. Turn on the power switch. After observing that the display indicates zeroes in all [11] positions release the keys.
(3) Then proceed to setting. The setting and key sequence are follows.

[1 digit entry] → [Validation function key]

| Code | Compulsive account Number entry | Account number holding |
|---|---|---|
| 1 | No | No |
| 2 | No | Yes |
| 3 | Yes | No |
| 4 | Yes | Yes |

Example: Programming the [CASH OUT] key for compulsive account number entry No and account number holding Yes.

Print on journal paper and slip

(4) Return the mode switch to the REG position.

## 3-14. (MRS14) Programming functions for check buffer function Yes/No and setting the werning and lockout points of check buffer memories.

The BE-2520 has 150 check memries. If amounts are entered into functions programmed for check buffer function Yes, they are placed in the corresponding memories in order of entry.

Warning point
If the count of entries into functions programmed for check buffer function Yes reaches the warning point, "A" appears in the 13th column of the display.

Lockout point
If the count of entries into functions programmed for check buffer function yes reaches the checkout point, the machine refuses any further entry into these functions.

(1) Set the mode switch to "Z" position (Power switch off)
(2) Depress numeric key [3] and [dep] key at the same time.
Turn on the power switch. After making sure the display indicates zeroes in all 11 positions release the keys.
(3) Then, proceed to make the setting as follows:

- Programming functions for check buffer function Yes/No

[1-digit entry] → [validation function key]

- To program a specific function for check buffer function No, input "1".
- To program a specific function for check buffer function Yes, input "2".

Example: To programming CASH CHECK for check buffer function Yes.

| Step | Key operation | Display |
|---|---|---|
| 1 | 2 | ▽ Z 000.000.000.02 |
| 2 | [CASH CHECK] | ▽ Z 000.000.000.00 |

Print on journal paper and slip

- Setting the warning point

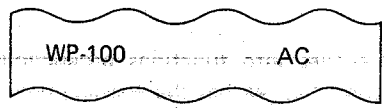
Input the specified number → DUP key

1 thru 150

Example: To set the warning point to 100.

| Step | Key operation | Display |
|---|---|---|
| 1 | 100 | ▽Z 000.000.001.00 |
| 2 | DUP | ▽Z 000.000.000.00 |

Print on journal paper and slip




- Setting the lockout point

Input the specified number → ACCT # key

Lockout point 1 thru 150

Example: To set the lockout point to 120.

| Step | Key operation | Display |
|---|---|---|
| 1 | 120 | ▽Z 000.000.001.20 |
| 2 | ACCT # | ▽Z 000.000.000.00 |

Print on journal paper and slip

(4) Return mode switch to REG position.

- Make sure the entered code is printed on the journal, then turn the mode switch back to "REG" position.

## 3-15. (MRS15) Selection of sentinel amount "Yes" or "No". To select sentinel amount "Yes," enter a desired amount.

If the sentinel amount is programmed, "L" appears in the 13th column of the display when the net total of reaches or exceeds the programmed amount.

(1) Set the mode switch to "Z" position. (power switch off)

(2) Depress numeric key [4] and [CLEAR] key at the same time. Turn on the power switch. After observing that the display indicates zeroes in all 11 positions release the keys.

(3) Then, proceed to setting. The setting and key sequence are as follows.

To program no sentinel amount

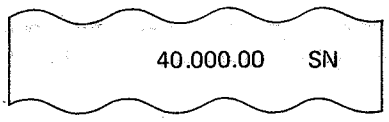
Input the sentinel amount → ACCT # key

max. 12 digits (min. amount: 1)

Example: Programming the sentinel amount as $40,000.00.

| Step | Key operation | Display |
|---|---|---|
| 1 | 4000000 | ▽Z 000.040.000.00 |
| 2 | ACCT # | ▽Z 000.000.000.00 |

Print on journal paper and slip




(4) Return mode switch to REG position.

- Make sure the entered sentinel amount is printed on the journal, then set the mode switch to "REG" position.

Note:
- If the sentinel amount is equal to or less than the grand totalizer net, it is displayed accompanied with the symbol "L" in the 13th column.
- The sentinel amount is to be positive.
- The sentinel amount must not be set at "0."

## 3-16. (MRS-16) Calendar timer function programming and choice of print format

Programming the clock function Yes/No and selecting the print format

(1) Setting the mode switch to "Z" position. (Power switch off)

(2) Depress numeric key [5] and [LIST] key at the same time. Turn on the power switch. After observing that

the display indicates zeroes in all 11 positions release the keys.

(3) Then, proceed to setting. The setting and key sequence are as follows.

- Programming the clock function as Yes/No

1-digit entry → BAL key

| Code | Clock function | Date format | Time system |
|---|---|---|---|
| 1 | No | – | – |
| 2 | Yes | M – D – Y | AM/PM system |
| 3 | Yes | Y – M – D | AM/PM system |
| 4 | Yes | D – M – Y | AM/PM System |
| 5 | Yes | M – D – Y | Military system |
| 6 | Yes | Y – M – D | Military system |
| 7 | Yes | D – M – Y | Military system |

Note: M: Month
D: Day
Y: Year

Example: Programming the clock function as Yes, data format as M-D-Y, and time system as AM/PM system.

| Step | Key operation | Display |
|---|---|---|
| 1 | 2 | ▽Z 000.000.000.02 |
| 2 | BAL | ▽Z 000.000.000.00 |

Print on journal paper and slip

- Selecting the print format

1-digit entry → ACCT # key

| Code | Print format |
|---|---|
| 1 | Print format 1 (time print No) |
| 2 | Print format 2 (timer print Yes) Format 1200-100–1159 |
| 3 | Print format 3 (time print Yes) Format 000-2359 |

Example: Selecting print format 2

| Step | Key operation | Display |
|---|---|---|
| 1 | 2 | ▽Z 000.000.000.02 |
| 2 | ACCT # | ▽Z 000.000.000.00 |

Print on journal paper and slip

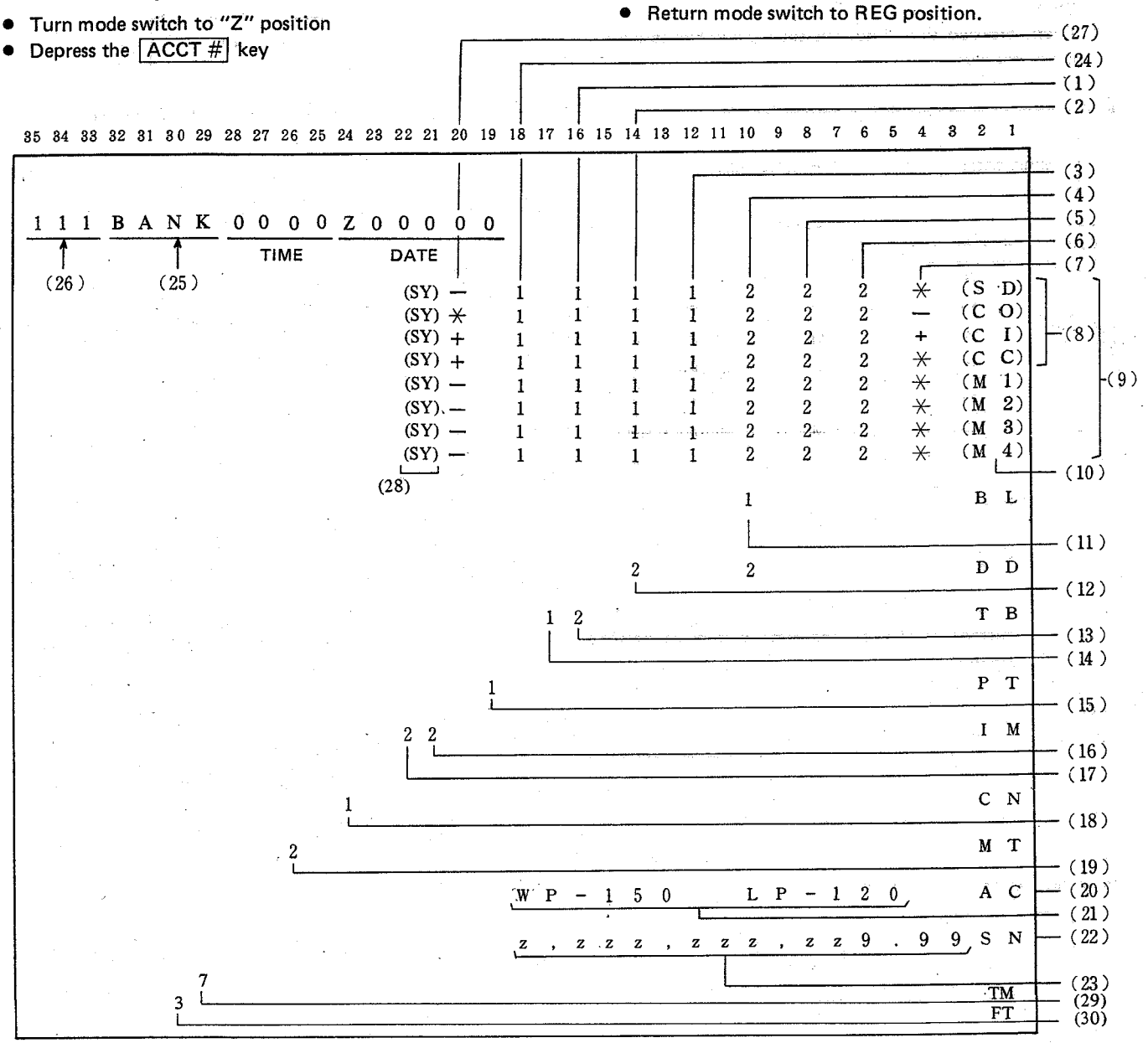
(4) Return the mode switch to the REG position.

## 3-17. Checking the presetting contents

- Turn mode switch to "Z" position
- Depress the [ACCT #] key

– Contents of the presetting operation will be printed

- Return mode switch to REG position.




(Slip print)

(1) Auto check function "Yes"/"No" ..... MRS14
(2) Amount print "Yes"/"No" ..... MRS10
(3) "DUP" key pushing forced/unforced ..... MRS5
(4) Compulsory slip ..... MRS4
(5) Accumulation or no accumulation into batch totalizer ..... MRS3
(6) Consecutive number countup/dead ..... MRS3
(7) Validation function key, +, —, non-add (*) .. MRS3
(8) Four validation function keys ..... MRS1
(9) Eight validation founction keys ..... MRS1
(10) Validation function key code ..... MRS2
(11) • Availability of the BAL key slip detect function
(12) "DUP" key pushdown count ..... MRS5
(13) TAB selection ..... MRS6
(14) Zero suppression symbol ..... MRS6
(15) One cycle or double cycle printing ..... MRS8
(16) Selection of the "00" or "000" key ..... MRS1
(17) Selection of four or eight validation functions ..... MRS1
(18) Resettable or non-resettable consecutive number ..... MRS11
(19) Selection of total print for validation functions set as negative ones ..... MRS12
(20) Autocheck
(21) Auto check buffer warning point and lock out print ..... MRS14
(22) Selection of sentinel amount "Yes"/"No" .. MRS15
(23) Sentinal amount
(24) Compulsive or non-compulsive depression of the ACCT # key ..... MRS13
(25) Bank ID ..... MRS2
(26) Teller No. and/or machine No. ..... MRS7
(27) List balance symbol: +, —, NON ADD(*) . MRS-11
(28) Duplicate print sign ..... MRS-2
(29) Time function ..... MRS-16
(30) Print format ..... MRS-16

# 4. TEST PROGRAM

There are a number of test programs incorporated within the BE-2520 in order to execute various checks of the machine without requiring special checking devices.
Test programs will be in one of two categories:

1) Auto aging tests (automatically tests display and printer)
2) Manual tests (a key entry will decide what test is to be performed).

## 4-1. Types of test programs

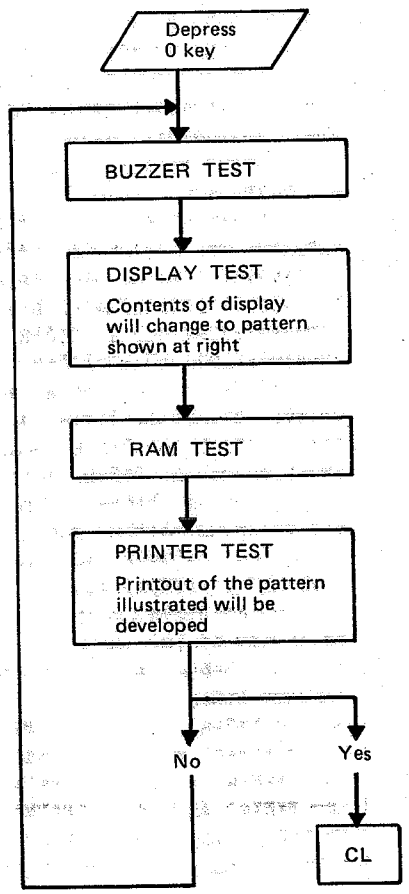
| Designation key | | Items |
|---|---|---|
| Numeric key | 0 | Aging test |
| | 1 | Buzzer test |
| | 2 | Display test |
| | 3 | RAM test |
| | 4 | Printer test |
| | 5 | Slip sensor test |
| | 6 | Mode switch test |
| | 7 | Operational key test |
| | 8 | Clock test |

## 4-2. Test mode

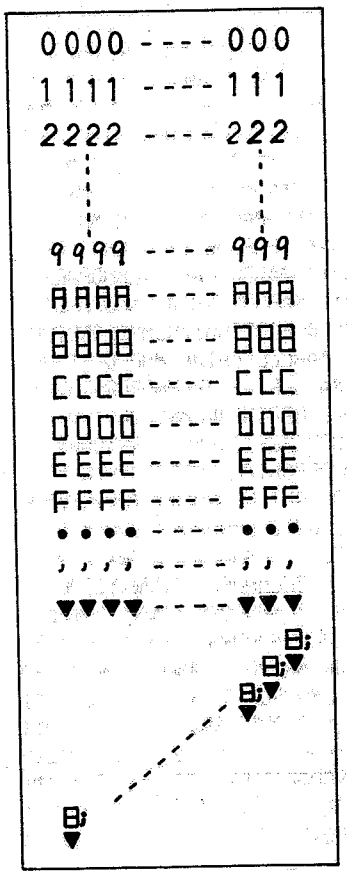
To SET UP the BE-2520 for the test mode operation, the following must be performed:

1. Turn power switch to "OFF".
2. Turn mode switch to the "Z" position.
3. Depress and hold down the "9" and the "R/N" keys.
4. Turn power switch to "ON".
   Note: The machine will show the letter "C" (CCC..... CC) across the entire display indicating the test mode.
5. Release the "9" and the "R/N" keys.
   To GET OUT of the test mode operation, the manual (Initial) Reset operation ("2-1". Program reset or "2-2". Master reset) must be performed.

## 4-3. Aging test




*DISPLAY TEST PATTERN*

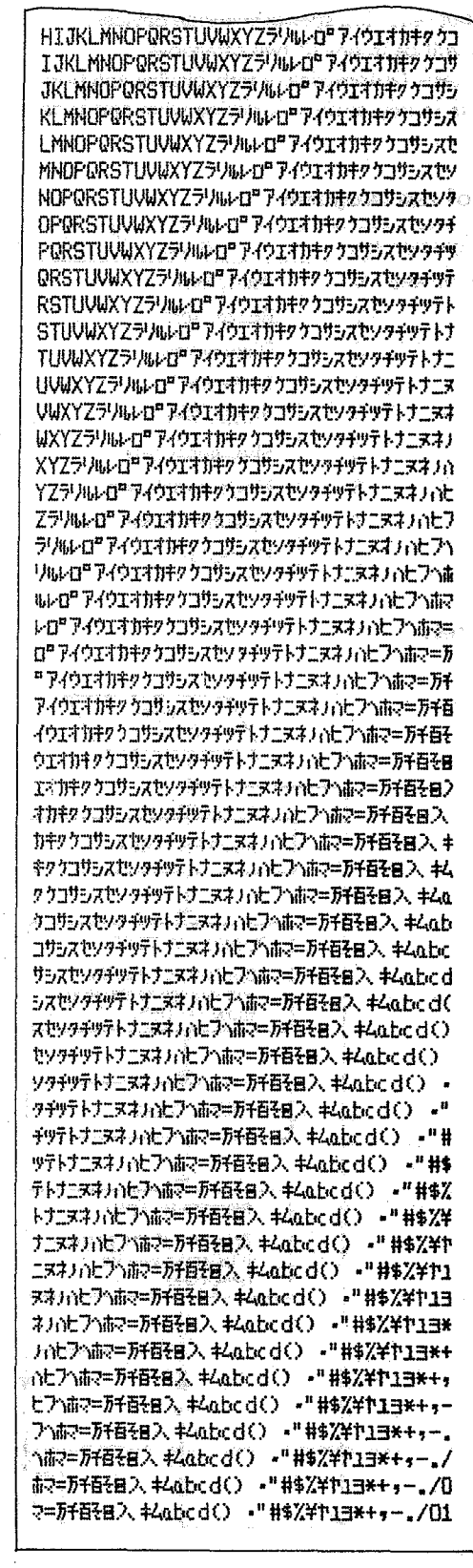



Note: Depressing the [CL] key will end the aging test. [CL] key entry is not accepted during the print test (must be depressed before or after printing).

- Print patten of pinter test (for one cycle)

(to be continued)

(continued)



## 4-4. Manual test

For the manual test, select the numerical key, [1] thru [7], for the test to be performed. For example: [3] is for RAM test

(1) Buzzer test

- Depress the [1] key
  - A one shot buzzer will sound.

(2) Display test

- Depress the [2] key
  - The display will follow the same sequence as in the aging test.

(3) RAM test

- To set up the RAM test:
  Depress the [3] key
  - A one shot buzzer will sound if there is no error detected.

  This test is for RAM 1 only. The test will write then read four kinds of data to/from each address of RAM 1 in the following order:

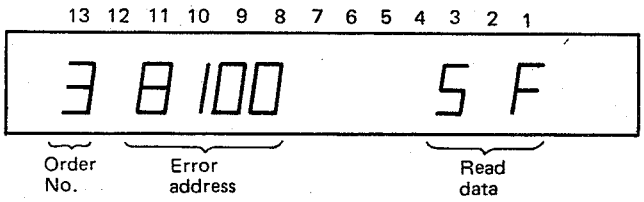
| Order No. | Write data |
|---|---|
| 1 | 55 |
| 2 | AA |
| 3 | FF |
| 4 | 00 |

RAM 2 is not installed.

Note: Data is writen into each address (8100 to 87FF) of RAM 1.
RAM addresses (8000 to 80FF) are not checked via this test, but these addresses are used as a working area for the test function.

If there is an error detected while reading, the display will change from all " [ " to the following:

Example




The write data for order No.3 was FF, however, instead of reading FF, it read 5F which is the error shown in the example.

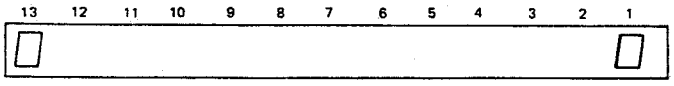
- The preset area is cleared to zero after the RAM test.

(4) Printer test

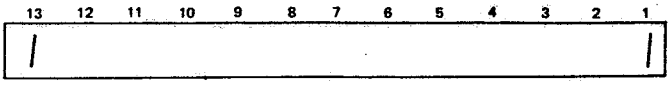
- Depress the [4] key
  - The printer will then start printing. The same pattern described in the aging test.
  - Printer will stop at the end of sequence.

(5) Card (slip) sensor test

- Depress the [5] key;
  - The display will change from all " [ " to the following:




- Insert a slip
  - The display will change from zero to the following:




  - If the display does not change to a "1." the slip sensor is probably defective.
- Depress the [CL] key to end the test.

(6) Mode switch test

- Depress the [6] key
  - Digits 1 thru 12 are blank on the display by turning the mode switch to the different mode positions.
  - Digit 13 will display the following:

| Display code (Digit 13) | Position of mode switch |
|---|---|
| 1 | PGM mode |
| 2 | BTL mode |
| 3 | REG mode |
| 4 | Z mode |

Note: If an open is present, the number "5" will be displayed.

- Depress the [CL] to end test

(7) Key test

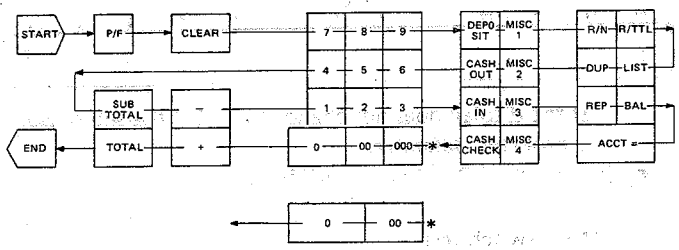
- Depress the [7] key
  Note: The display will indicate which key is to be depressed, in the 1st and 2nd digit positions.
- Depress each key in the sequence shown below.
  - If a key is depressed out of sequence, or, a key switch is defective (not making contact) which will throw it out of sequence, and the error sound will occur. The machine will wait until the sequence is continued (correct key is depressed).
  - Depression of the last key in the sequence will end this test and the display will change back to "C" display for all digits.

  Note: As the BE-2520 key board can be modified, perform the key test after the key layout presetting. For the key layout presetting, refer to section 3-1 (MRS1) on page 16.

- Since the key function assignment is done at the time of initialization with the BE-2520, the overall key test must be carried out after completion of the key function assignment.
  If the contents of the key function assignment memory is other than the code setup, the overall key test is carried out with the depression of the [00] key in the 8 items mode.
  After completion of the RAM test, the overall key test is carried out by the depression of the [00] key in the 8 items mode.

- Key depression sequence
  If a key is depressed in the wrong order, buzzer sound occurs and the machine awaits depression of the correct key.

Standard Key Layout

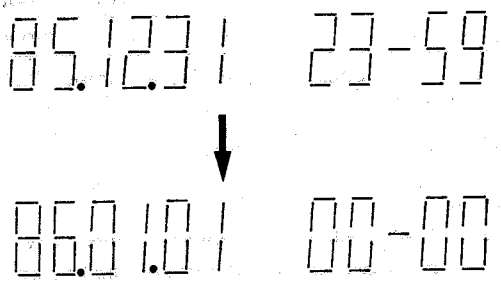



[→: key depression order]

(8) Calendar timer test

- Press the [8] key.
  23 hours, 59 minutes, December, 31st, 1985, will be stored. The date and time are then displayed. Confirm after a lapse of a minute that the calendar timer advances to 00 hours and 00 minutes.

Display



- With the depression of the CL key, all display columns change to "C", and is ready for the next test command entry.

# 5. CIRCUIT DESCRIPTIONS

## 5-1. Basic clock

Basic clock pulse is produced from the clock generator (M54812L). Frequency of the basic clock ($\phi$) is created by the crystal oscillator element (4.19MHz).

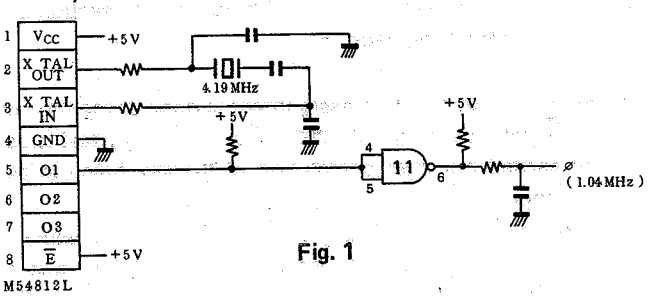



Fig. 1

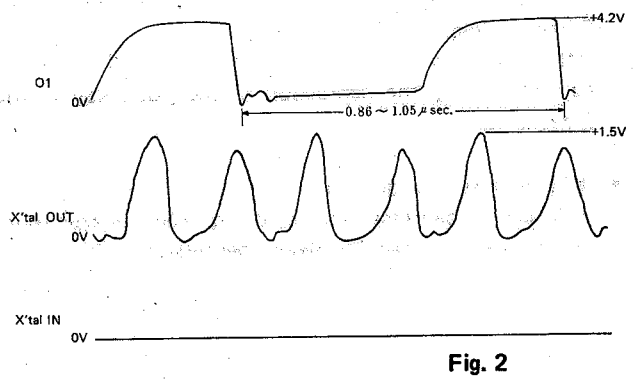



Fig. 2

**POWER ON CONDITION:**

With $\overline{POFF}$ at a low level, point (a) will also be at a low level. This, will cause $\overline{RESET}$ to go to a low level. When $\overline{RESET}$ is at a low level the CPU is in a reset condition. This reset condition will result in the signal $\overline{HALT}$ going to a high level.

When $\overline{POFF}$ goes to a high level, capacitor C1 will charge up through resistor R1 and diode D7. After C1 has charged up, point (a) will reach a high level. This will result in $\overline{RESET}$ going to a high level causing all circuits to be released from a reset condition and allow the CPU to start operating.

**POWER OFF CONDITION:**

Upon power off the signal $\overline{POFF}$ will go to a low level. When the CPU detects this condition the signal $\overline{HALT}$ will also go to a low level.

By HALT going low, point (a) will also go low and cause capacitor C1 to discharge driving point (a) to a low level.

At the same time $\overline{RESET}$ also goes to a low level resulting in putting all the circuits in a reset condition ready for power failure.

TIME CHART

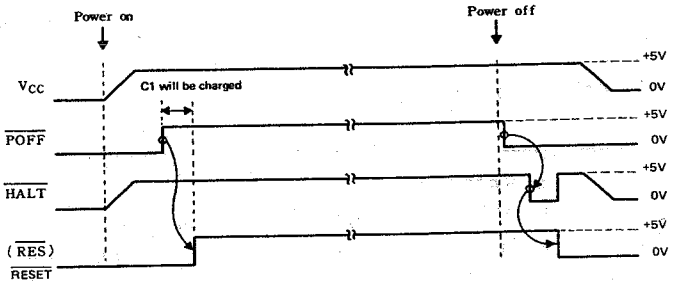



Fig. 4

## 5-2. Reset (RES) Circuit

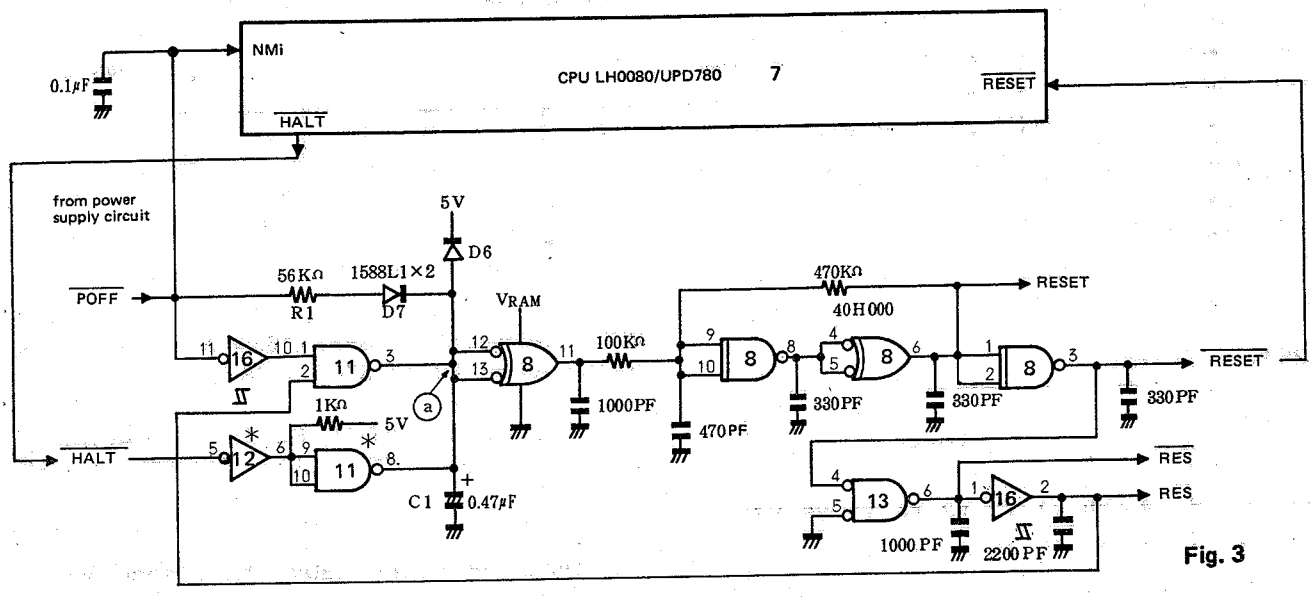
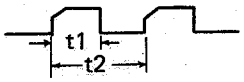



Fig. 3

## 5-3. Signal description table

CPU, ROM, RAM

| Signal | Description |
|---|---|
| $\phi$ | Basic clock pulse<br>  <br>t1: 0.43 ~ 0.53μs<br>t2: 0.86 ~ 1.05μs |
| $\overline{POFF}$ | Power off signal<br>Power on; High, Power off: Low<br>Originated in power supply PWB. |
| $\overline{MREQ}$ | Memory request (ROM, RAM)<br>Memory designation: Low |
| $\overline{IORQ}$ | I/O device request I/O designation: Low<br>(Key, Display, Printer etc.) |
| $\overline{RES}$<br>$\overline{HALT}$<br>$\overline{INT}$<br>$\overline{WR}$<br>$\overline{RD}$<br>D0 ~ D7<br>A0 ~ A15 | Reset<br>Power on state: High, Power off: Low<br>Halt CPU halt state: Low<br>Interrupt input for printer controller<br>Write<br>Read<br>Data bus<br>Address bus |
| $\overline{BZ}$ | Buzzer Low: Buzzer on |
| $\overline{ROM1}$<br>$\overline{ROM2}$ | P-ROM1 select signal<br>Not used |
| $\overline{RAM1}$ | RAM1 select signal |
| $\overline{RAM2}$ | Not used. |

- FOR FURTHER DESCRIPTION OF THE CPU Z-80, REFER TO THE "CASH REGISTER BASIC MANUAL".

## 5-4. ROM, RAM control

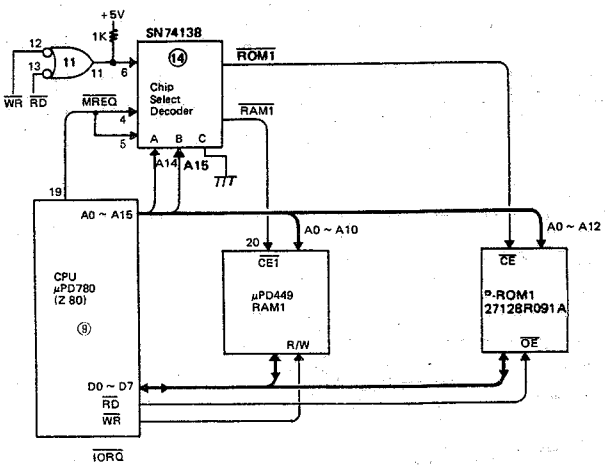



Fig. 5

P-ROM 27128R091A: 16K bytes
RAM μPD449: 2K bytes

- Chip select for ROM or RAM is attained by means of the $\overline{MREQ}$, $\overline{WR}$, $\overline{RD}$, A14 and A15, which are sent by the CPU to the chip select decoder (SN74LS138). Depending on the states of these signals (as described in the following page), only one of the memory enabling signals will go low.
- The CPU will address ROM or RAM directly by the address bus lines.
- Once it has been established (by the CPU) which memory has been chip selected and addressed, reading or writing will take place via the data bus lines (D0 ~ D7) by a unit of eight bits.
- Read and write for the RAM are identified by the $\overline{WR}$ (write) signal.

ROM, RAM Chip Select Decoder

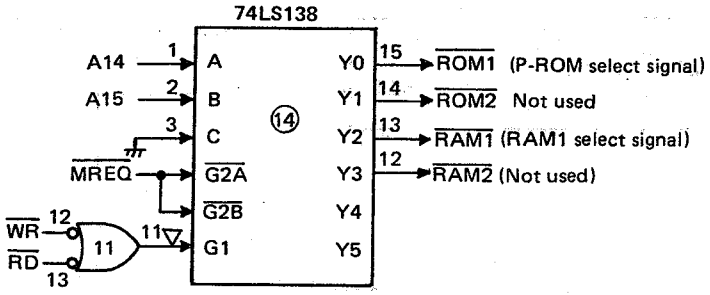



Fig. 7

74LS138 Function Table

| Inputs | | | | | Outputs | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enable | | Select | | | | | | | | | | |
| G1 | G2* | C | B | A | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| X | H | X | X | X | H | H | H | H | H | H | H | H |
| L | X | X | X | X | H | H | H | H | H | H | H | H |
| H | L | L | L | L | L | H | H | H | H | H | H | H |
| H | L | L | L | H | H | L | H | H | H | H | H | H |
| H | L | L | H | L | H | H | L | H | H | H | H | H |
| H | L | L | H | H | H | H | H | L | H | H | H | H |
| H | L | H | L | L | H | H | H | H | L | H | H | H |
| H | L | H | L | H | H | H | H | H | H | L | H | H |
| H | L | H | H | L | H | H | H | H | H | H | L | H |
| H | L | H | H | H | H | H | H | H | H | H | H | L |

- G2 = G2A + G2B

- Chip select Decoder (SN74LS138)

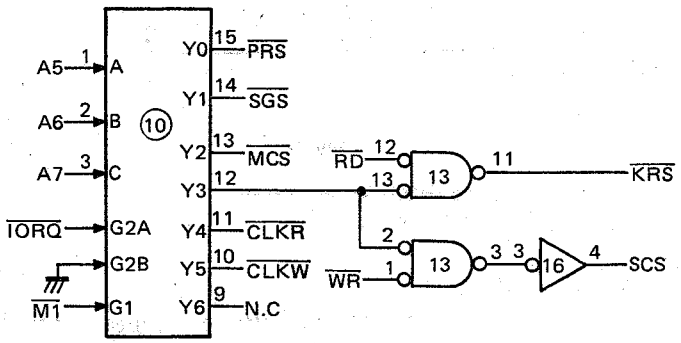
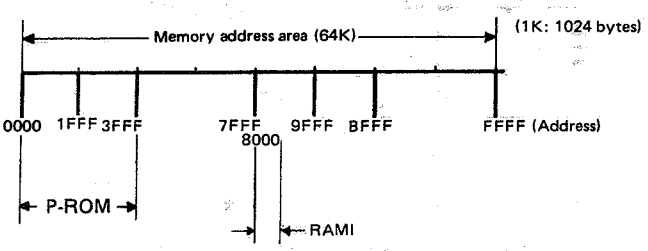



Fig. 8

IORQ: I/O Request
PRS: Printer select
SGS: Display segment select
MCS: Display segment (DP. COM. ▼), buzzer select
KRS: Key read select
CLKR: Clock IC Read.
CLKW: Clock IC write.
SCS: Display digits select
KRS: Key scan signal

- Memory addresses used in BE-2520
  MREQ: Low



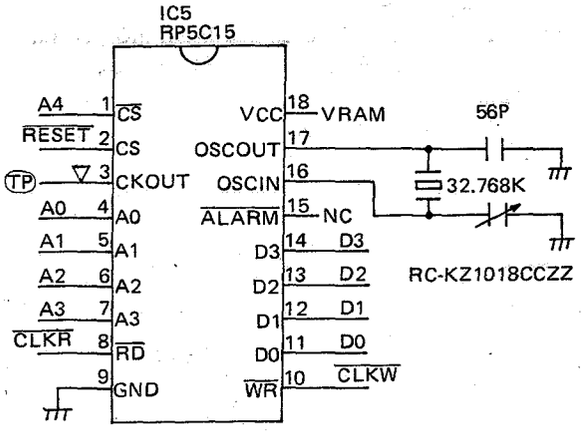

ROM1: Address 0000 ~ 3FFF (16384 Addresses) . . . 16K
RAM1: Address 8000 ~ 87FF (2048 Addresses) . . . 2K

FOR THE TIMING CHART, REFER TO CHAPTER 10 (CPU Z-80) OF THE "CASH REGISTER BASIC MANUAL".

## 5-5. Signal description table (Key, mode switch, display)

| Signal | Description |
|---|---|
| SCS | Display digit and key scan data strobe (Enabling signal for the (4514) 4-16 decoder.) |
| KS0 ~ KS6 | Key strobe ~ Key strobe |
| KS7<br>KR0 ~ KR5 | Mode switch strobe<br>Key (Mode switch) read (return) ~ Key (Mode switch) read (return) |
| KRS | Key read strobe (enabling signal for 3-state buffer) |
| G1 ~ G13 | Display digit designate (1st digit) ~ Display digit designate (13th digit)<br>Designate: High |
| a ~ g<br>DP<br>▼<br>COM | Display segment select (a) ~ Display segment select (g) Select: High<br>Display decimal point select (DP)<br>Display arrow segment select ( ▼ )<br>Display comma segment select ( , ) |
| SGS<br>MCS<br>BZ | Display segment data strobe<br>Display segment (DP, COM, ▼ ) and buzzer data strobe<br>Buzzer Low: Buzzer on |

## 5-6. Calendar timer control




The CPU controls the calendar timer chip RP5C15.

1) The calendar timer is read and written using the A0–A4 I/O command. The data can be read or written by specifying the I/O address of the specific register.

2) Significance of RP5C15 input/output signals

| Signal name | Discription |
|---|---|
| $\overline{CS}$ | Used for interfacing with an external device. Valid when CS = H and $\overline{CS}$ = L. Connected to the A4 line. |
| CS | Connected to the RESET line. |
| CKOUT | Basic clock output |
| A0-A3 | Address input. Connected to the CPU address bus |
| RD | I/O control input. Goes low when data is read from the PR5C15 to the CPU. |
| WR | I/O control input, Goes low when data is read from the CPU to the PR5C15. |
| D0-D3 | Calender timer data input/output |
| ALARM | Alarm output (1Hz or 16Hz), not used. |
| OSCIN | 32.768KHz crystal oscillation input |
| OSCOUT | 32.768kHz crystal oscillation output |
| VCC | Connected to the VRAM |

## 5-7. Key, mode switch and display control

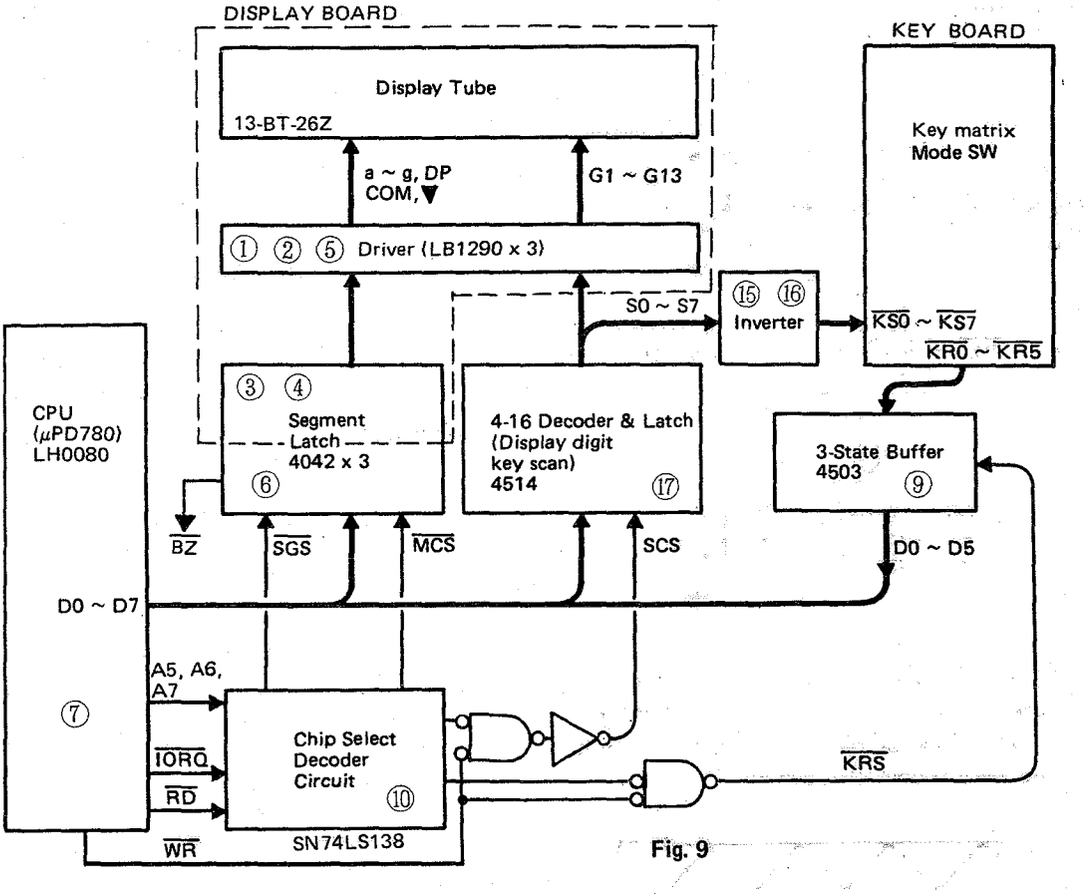



Fig. 9

$\overline{SGS}$: Segment select (a ~ g)
$\overline{MCS}$: Segment, buzzer select (DP, COM, ▼, buzzer)
SCS: Display digit (key scan) select
$\overline{KRS}$: Key read select
$\overline{KS0}$ ~ $\overline{KS6}$: Key scan
$\overline{KS7}$: Mode switch scan

$\overline{KR0}$ ~ $\overline{KR5}$: Key read (mode SW)
G1 ~ G13: Displyay digit
a ~ g, DP, COM, ▼: Display segment
$\overline{BZ}$: Buzzer

- The display segment data, grid signal information and keyboard strobe data are the output of the CPU via the D0 ~ D7 lines.
  - The segment data being sent to the segment latch
  - The keyboard strobe and grid signal information being sent to the "4-16 decoder". The strobing output of the "4-16 decoders" are used for strobing both the keyboard and the display grid signals.
- The strobing output of the "4-16 decoders" are sent thru an inverter and are now known as the keyboard and mode switch strobe signals $\overline{KS0}$ ~ $\overline{KS7}$.
- The $\overline{KR0}$ to $\overline{KR5}$ signals are the keyboard and mode switch return signals for the CPU.
  - These signals are sent to a 3-state buffer.
  - The 3-state buffer is enabled when the $\overline{KRS}$ signal is issued low.
  - When the 3-state buffer is enabled, the $\overline{KR0}$ ~ $\overline{KR5}$ information is allowed to pass through to the CPU for reading.

FOR FURTHER DETAILED EXPLANATION OF KEYBOARD AND MODE SWITCH READ FOR DISPLAY CONTROL OPERATION, REFER TO CHAPTER 9-2 AND CHAPTER 9-3 OF THE "CASH REGISTER BASIC MANUAL".

## 5-8. Buzzer circuit

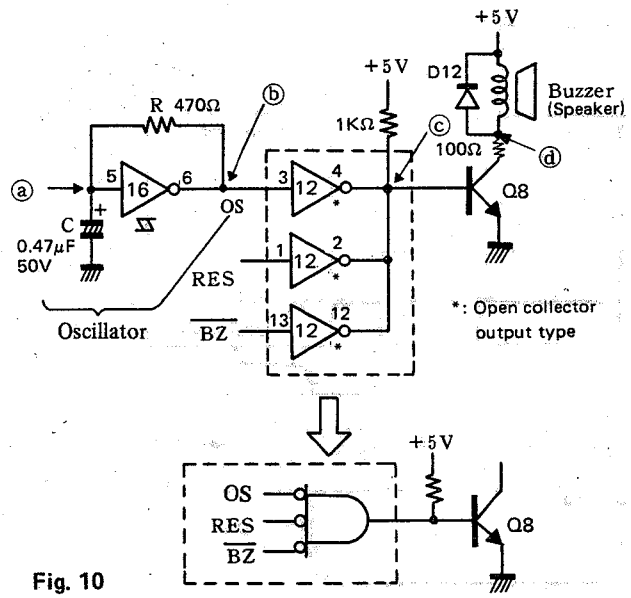



Fig. 10

Oscillator circuit

The resistor (R) and the capacitor (C) in combination with the schmidt trigger will produce an oscillation at point ⓐ. This oscillation will appear at the output of the schimidt trigger as a square wave at point ⓑ. See Fig. 11.

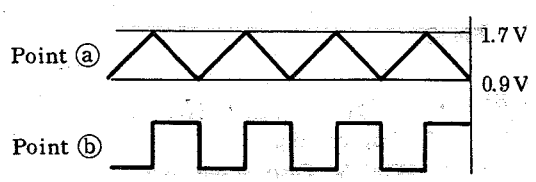



Fig. 11

RES (reset) signal is usually at a low level except when the power is turned on or off.

When the buzzer signal ($\overline{BZ}$) goes low level, inverted pulse of OS (point ⓑ) will appear at point ⓒ (the base of Q8) turning on and off Q8.

This will result in the Buzzer sounding.

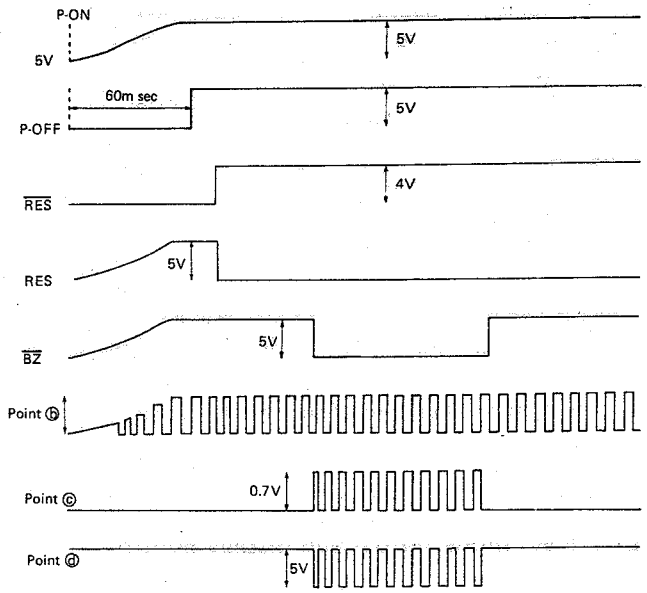
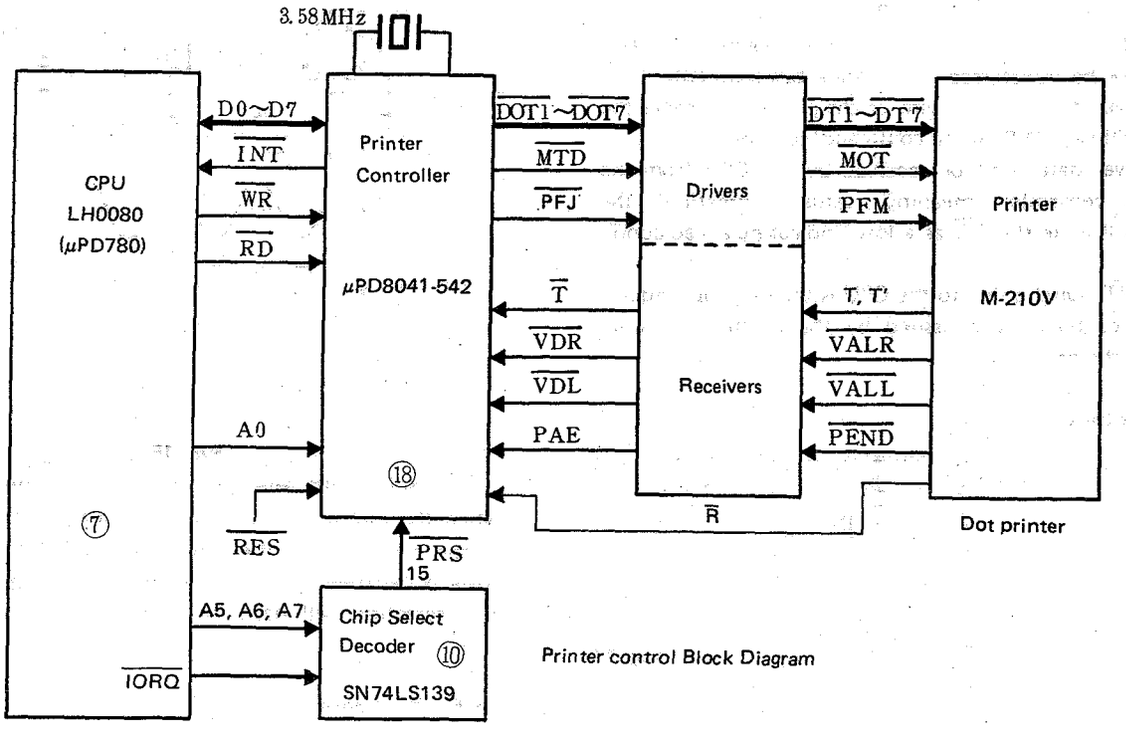



Fig. 12

## 5-9. Printer control




Printer control Block Diagram

Fig. 13

| | | Printer Unit Side |
|---|---|---|
| $\overline{INT}$ | : Interrupt request | |
| $\overline{DOT1}$~$\overline{DOT7}$ | : Dot wire select | $\overline{DT1}$~$\overline{DT7}$ |
| $\overline{MTD}$ | : Printer motor drive | $\overline{MOT}$ |
| $\overline{PFJ}$ | : Paper feed | $\overline{PFM}$ |
| $\overline{R}$ | : Printer reset | $\overline{R}$ |
| $\overline{T}$ | : Printer timing | T, T' |
| $\overline{VDR}$ | : Validation paper sense (Right) | $\overline{VALR}$ |
| $\overline{VDL}$ | : Validation paper sense (Left) | $\overline{VALL}$ |
| PAE | : Paper near end sense | $\overline{PEND}$ |
| $\overline{PRS}$ | : Printer controller select | |
| $\overline{RES}$ | : Reset with power on | |
| $\overline{IORQ}$ | : I/O request | |

### 5-9-1. Printer signal description

| Signal | Description |
|---|---|
| $\overline{VALR}$ | Validation paper sense (Right side)<br>Paper in: Low |
| $\overline{VALL}$<br>$\overline{PEND}$ | Validation paper sense (Left side)<br>Paper in: Low<br>Roll paper end<br>Paper near end: Low |
| $\overline{PRS}$ | Printer Controller chip select |
| $\overline{DT1}$<br>~<br>$\overline{DT7}$ | Dot wire (1) select<br>~<br>Dot wire (7) select<br>Select: Low |
| $\overline{MOT}$ | Motor drive<br>Motor on: Low |
| $\overline{PFM}$ | Journal paper feed<br>Paper feed: Low |
| $\overline{R}$ | Printer reset signal |
| T, T' | Printer timing signal |

$\overline{R}$, T, T' are generated from the printer with motor on.

### 5-9-2. Outline of printer control

- Whenever the CPU wants to send or receive data to or from the printer controller, it will chip select the controller by means of the signal $\overline{PRS}$ and the address A0. Once the printer controller has been selected, the data can now be transferred on the data bus lines (D0~D7).
- Whenever data is to be sent to the printer controller the CPU will issue $\overline{WR}$ (write command) as a low.
- Whenever data is to be received by the CPU from the printer controller (meaning, status information), the CPU will issue the $\overline{RD}$ as a low (indicating a read condition).
- The $\overline{INT}$ signal going to the CPU is the interrupt request signal or busy signal issued by the printer controller during the print cycle.

### 5-9-3. Motor Drive Circuit

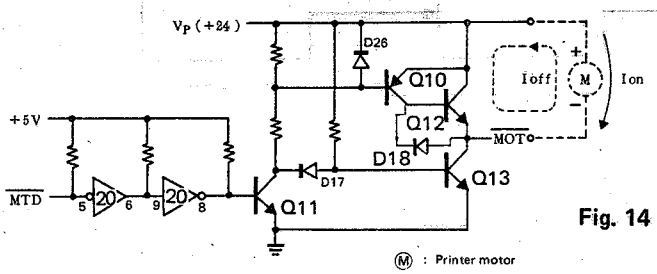



Fig. 14

- The motor drive circuit turns on the motor by providing a ground necessary to allow current to flow through the motor.
- In turning off the motor, we want to insure that the motor is turned off as quickly as possible. This circuit accomplished that by putting a direct short across the motor, thus, giving us a braking effect.

CIRCUIT DESCRIPTION

- Motor on
  1) The $\overline{MTD}$ signal is issued as a low.
  2) The low is inverted twice, giving a low to the base of transistor Q11, turning Q11 off.
  3) With Q11 off Vp (+24V) goes to one side of the motor and is also sent through a resistor to the base of Q13.
  4) A positive to the base of Q13 will turn Q13 on, which provides the ground to the other side of the motor. Current (Ion) is now allowed to flow through the motor. Motor turns on.

  NOTE: Q10 and Q12 are off at this time due to the positive voltage (at the voltage divider) being applied to the base to Q12.

- Motor off and braking
  1) $\overline{MTD}$ is issued as a high.
  2) High inverted twice gives us a high at base of Q11, Q11 → on
  3) Q11: on, a low (GND) through diode to the base of Q13 → off
  4) Q11: on, also provide a low (GND) to base of Q10, Q10 → on
  5) Q10: on → Q12: on, which provide a direct short across the motor. The motor will go off very quickly.

### 5-9-4. Timing signal generation

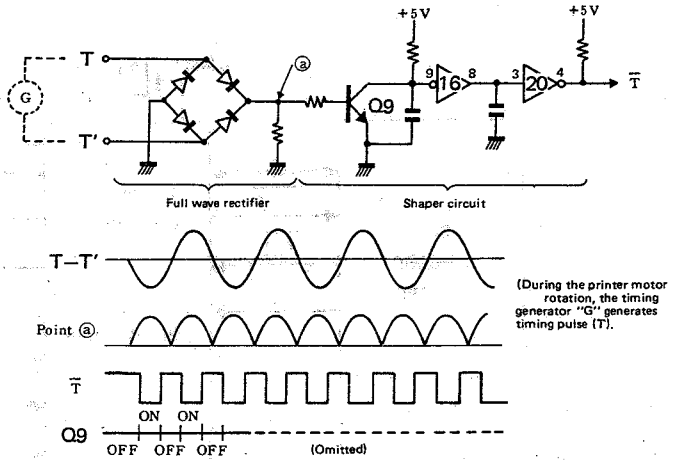



Fig. 15

Ⓖ: Timing pulse generater (in the printer motor)

When the motor is on and rotating, a generater within the motor will produce the timing pulse, T(T–T'). This TS pulse is rectified and shaped to the timing signal $\overline{T}$ . Dot wire selection will occur in relation to the timing signal ( $\overline{T}$ ).

### 5-9-5. Print control

The following is the sequence of events for printing.

- Motor on
  - Print head moves in a reciprocative (back and forth) motion.
  - Timing pulses (T) are constantly generated.
  - Reset pulse ($\overline{R}$) is developed every time the head moves from left to right.
  - Print action occurs only while head is moving from left to right (single directional print).
- The printer controller will issue out the dot select signals ($\overline{DOT1}$ ~ $\overline{DOT7}$) to the drivers. The drivers will provide the ground necessary to energize the solenoids.

  NOTE: The dot solenoid will be energized once in two timing pulses.
- Refering to Fig. 16 when the dot solenoid is energized, the actuating plate is pulled toward the solenoid. The dot wire is pushed by the actuating plate which hits the paper through the ink ribbon forming the dot on the paper. When the solenoid de-energizes, the wire will be restored to its original position by the return spring.

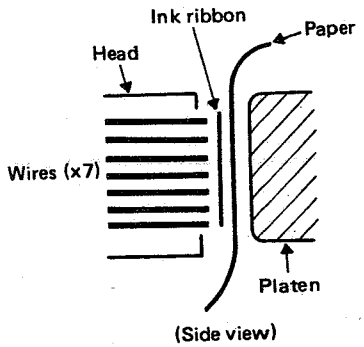



Fig. 16-(a)

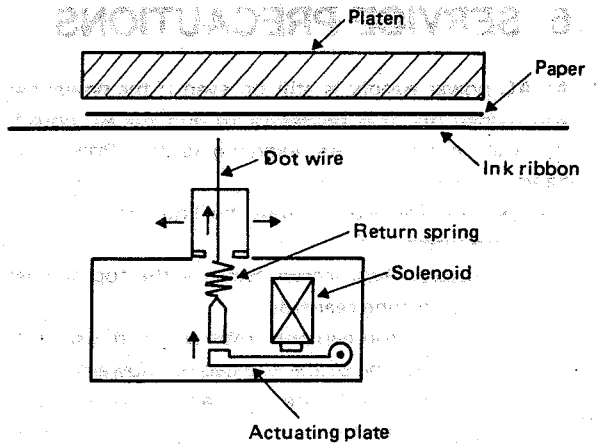



Fig. 16-(b)

### 5-9-6. Dot solenoid driver (solenoids 1 ~ 7)

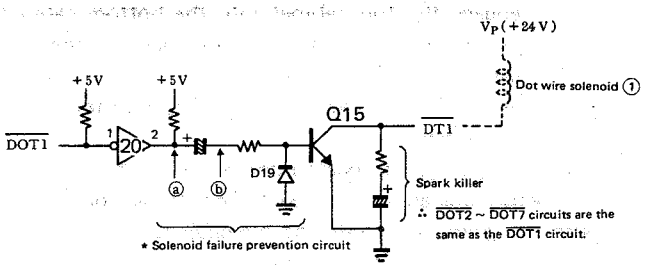



Fig. 17-(a)

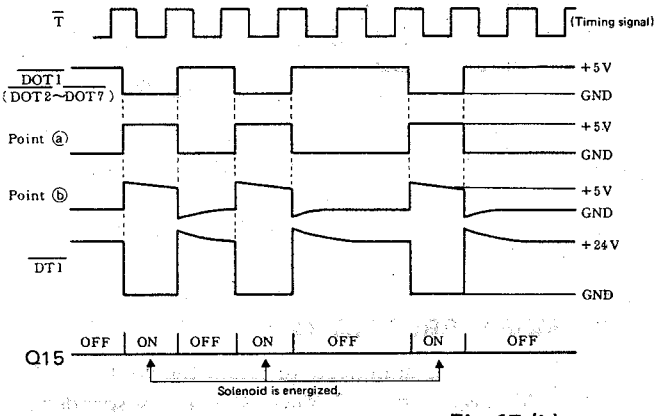



Fig. 17-(b)

- The DOT1 is issued by the printer controller as a low.
- The low will be inverted to a high (point ⓐ) which will be felt by the bese of Q15.
- Q15 turns on and supplies the dot wire solenoid with the ground needed for current flow.
- Current flows through solenoid → solenoid energized.
  NOTE: When the solenoid becames de-energized, the spike (produced by the collapsing magnetic field around the solenoid) will be absorbed by the resistor and capacitor with is connected between emitter and collector of Q15.
- Solenoid failure prevention circuit. Even if the signals DOT1 ~ DOT7 are kept at a low level continuously by circuit trouble, the solenoids are not kept on at a full voltage level, which could lead to solenoid failure.

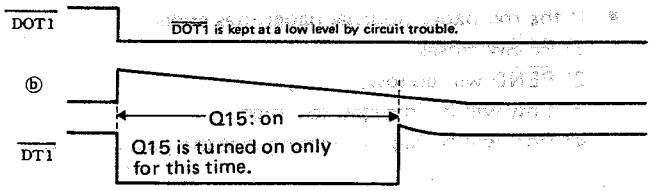
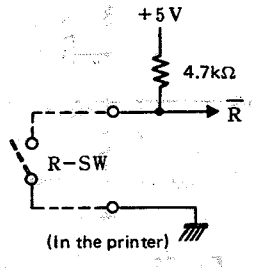



Fig. 18

### 5-9-7. Print reset signal ($\overline{R}$) reveiver




R-SW is turned on at each completion of one line printing causing $\overline{R}$ at a low level.

Fig. 19

## 5-10. Paper feed driver

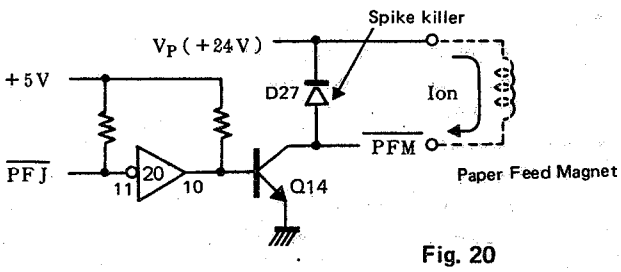



Fig. 20

- The printer controller will issue the PFJ signal as a low.
- The low will be inverted to a high which will turn Q14 on.
- With Q14 on, a ground is provided for current to flow through the paper feed magnet.
- Current (Ion) flowing through the magnet will cause the magnet to be energized and paper feeding will occur.
- After completion of a single line feed, the printer controller will issue the INT low to inquire whether further paper feed is required or not. The CPU will then send out a paper feed continue/discontinue command to the printer controller.

## 5-11. Paper end sensor

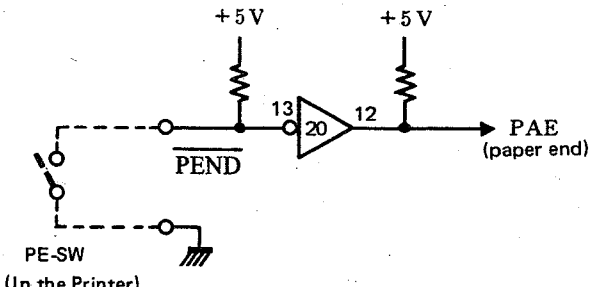



Fig. 21

- If the roll paper (journal paper) has ended:
  1) PE-SW closes.
  2) $\overline{\text{PEND}}$ will go low.
  3) Low will be inverted to a high.
  4) PAE will be high indicating that the paper has ended.

### 5-12. Slip sensor (*6)

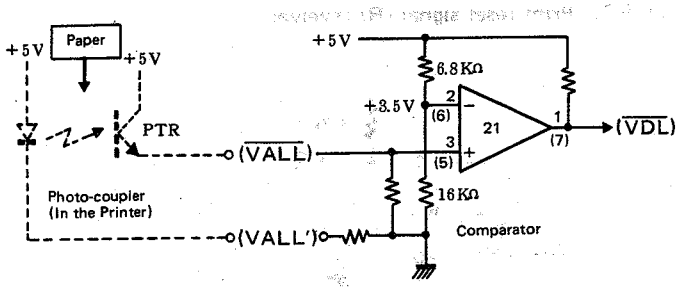



Fig. 22

($\overline{\text{VALL}}$): Validation paper sense

- No slip
  1) PTR (photo transistor) is on
  2) ($\overline{\text{VALL}}$) will be high (+5V)
  3) ($\overline{\text{VDL}}$) will be high (+5V)
- Slip inserted
  1) PTR is off
  2) ($\overline{\text{VALL}}$) will be low (GND)
  3) ($\overline{\text{VDL}}$) will be low (GND)

# 6. SERVICE PRECAUTIONS

1) As AC power supply is still on even if the power switch was turned off, it is necessary to pull the AC cord from the wall outlet before exchanging the PWB unit or handing connectors.
2) Dismounting and Mounting of the Top Cabinet
   a) Dismounting
      (1) Unscrew two screws securing the top cabinet on the machine rear side.
      (2) Pull the top cabinet upwards. At the same time, pull one side of the top cabinet upwards. This will cause the top cabinet to be separated from its position.
   b) Mounting
      (1) Latch the front part of the top cabinet with the bottom cabinet in the first place, and then engage the top cabinet into the bottom cabinet by depressing the upper rear part of the top cabinet.
      (2) Secure the top cabinet in its place with the use of two screws.
3) Pull the paper guide, located above the printer, towards you before unstalling the top cabinet. Be cautious not to push this guide down with the top cabinet.

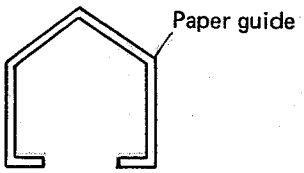



Fig. 23

## MEMORY PROTECTION

Ni-Cd battery is employed to retain the contents of the RAM even if the AC power source is suspended.

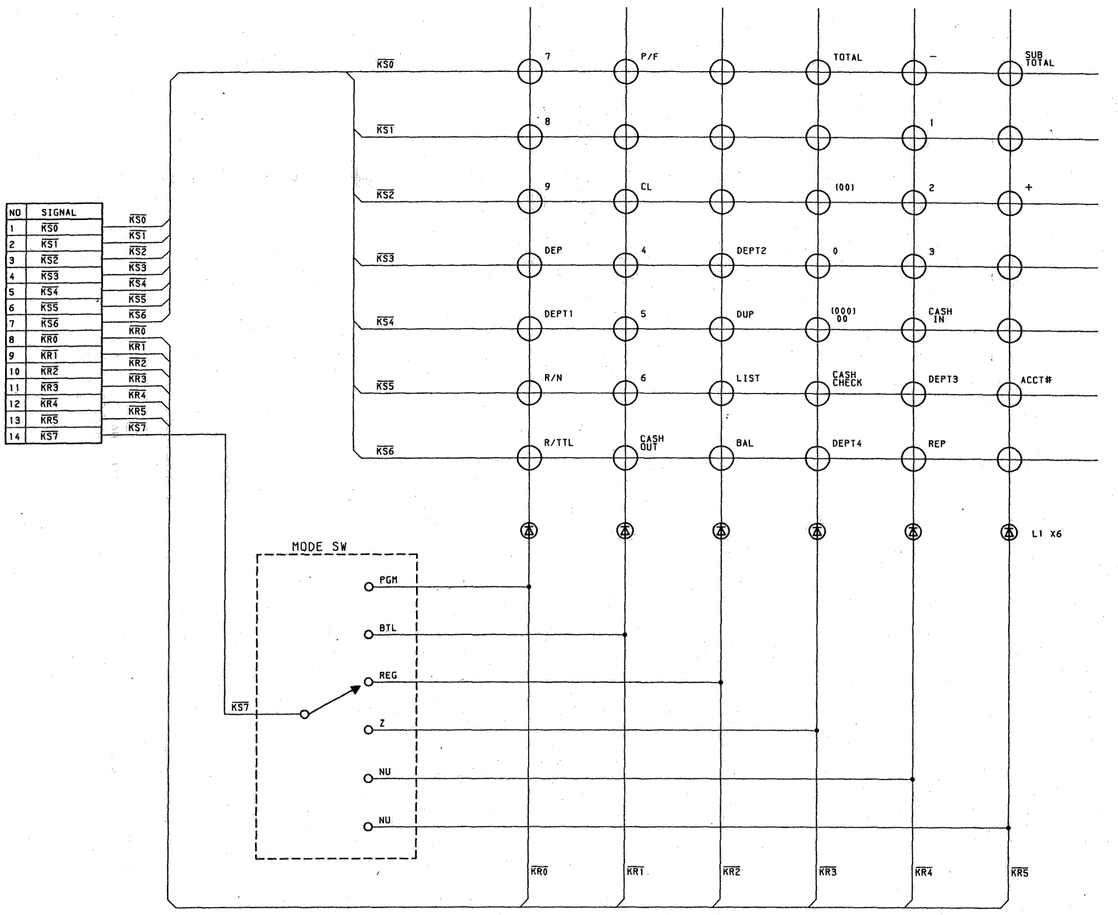
(1) Retaining time: About 1 mongth (when the battery is fully charged, but it may be longer depending on the condition provided.)

(2) Charging time: About 50 hours (from complete discharge to full charge)

(3) Note: Although the battery was fully charged when it left the factory, it may lose its power if shipment to the dealer takes more than one month. So to insure that the customer does not lose any program information due to weak batteries, please charge the batteries for the above mentioned time before giving the machine to the customer.

# 7. CIRCUIT DIAGRAM AND CIRCUIT BOARD LAYOUT

## 7-1. Key board circuit

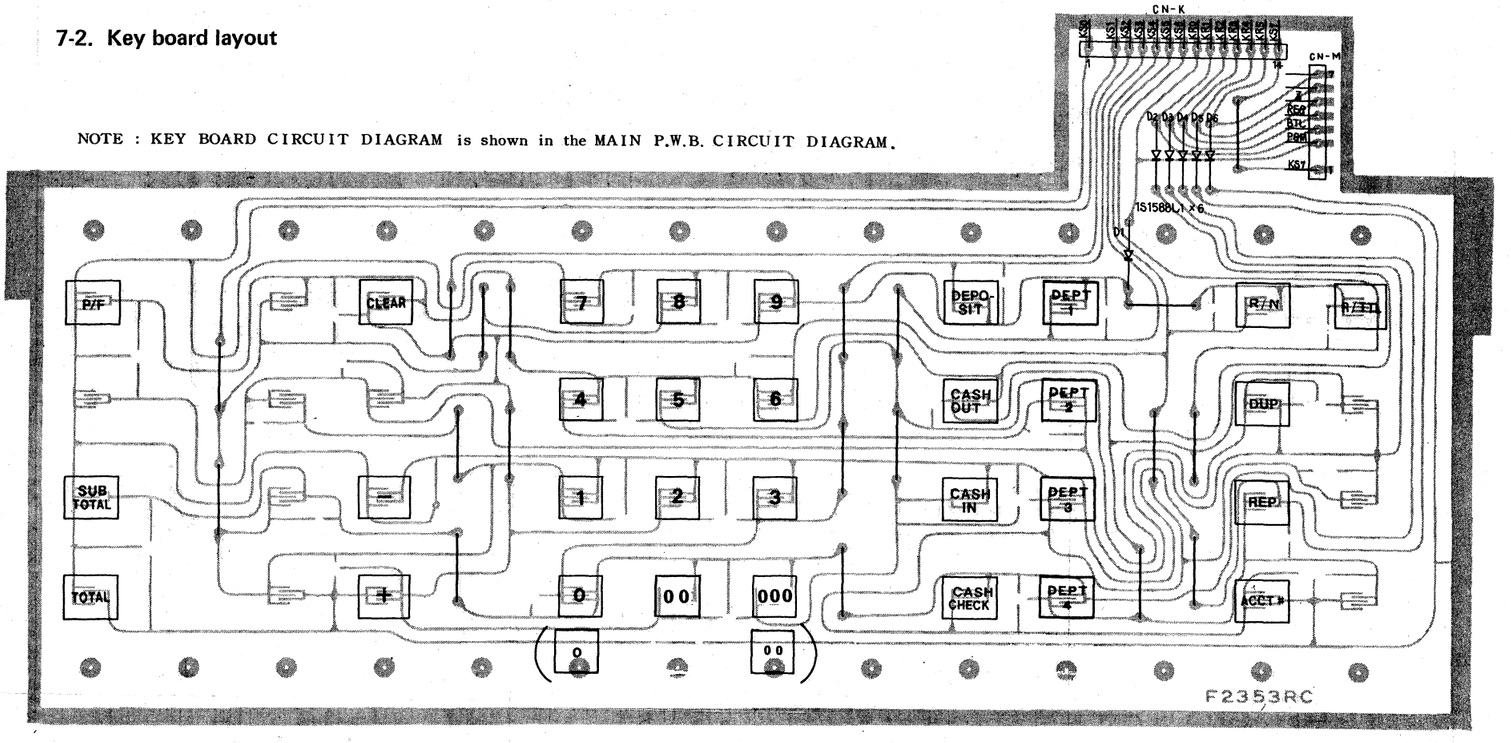


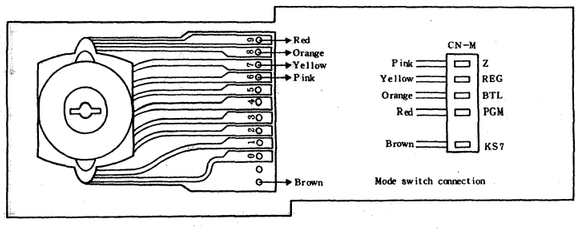

| NO | SIGNAL |
|---|---|
| 1 | KS0 |
| 2 | KS1 |
| 3 | KS2 |
| 4 | KS3 |
| 5 | KS4 |
| 6 | KS5 |
| 7 | KS6 |
| 8 | KR0 |
| 9 | KR1 |
| 10 | KR2 |
| 11 | KR3 |
| 12 | KR4 |
| 13 | KR5 |
| 14 | KS7 |

CAD-R0283

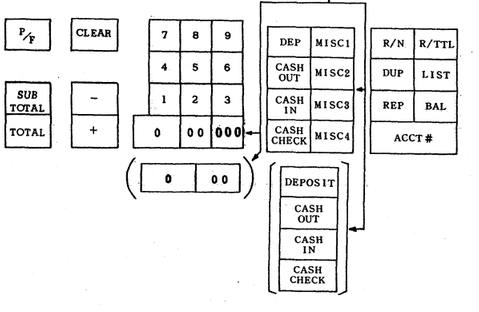
## 7-2. Key board layout

NOTE : KEY BOARD CIRCUIT DIAGRAM is shown in the MAIN P.W.B. CIRCUIT DIAGRAM.



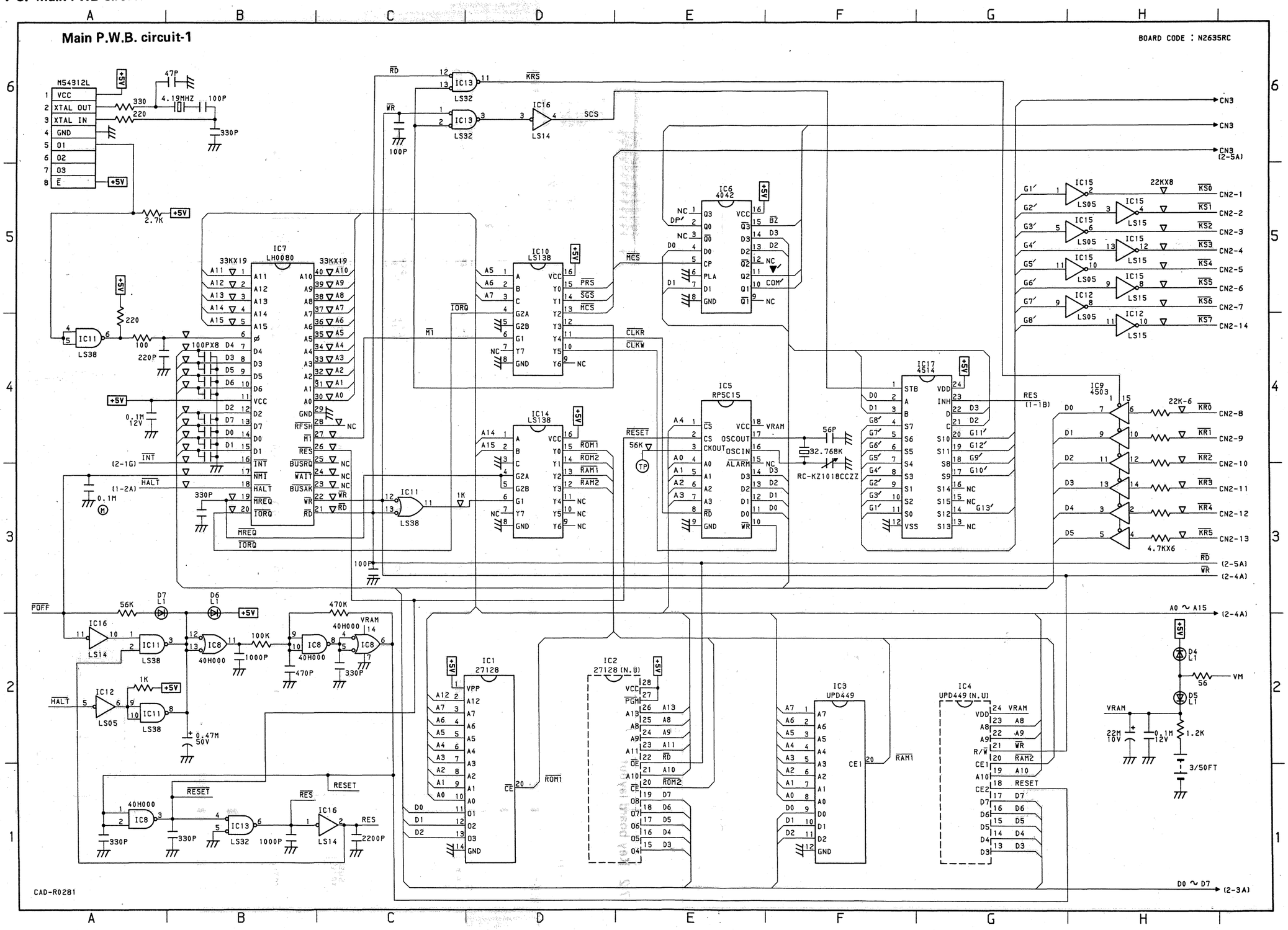

It can be selected via the initial preseting (MRS1).



## 7-3. Main PWB circuit

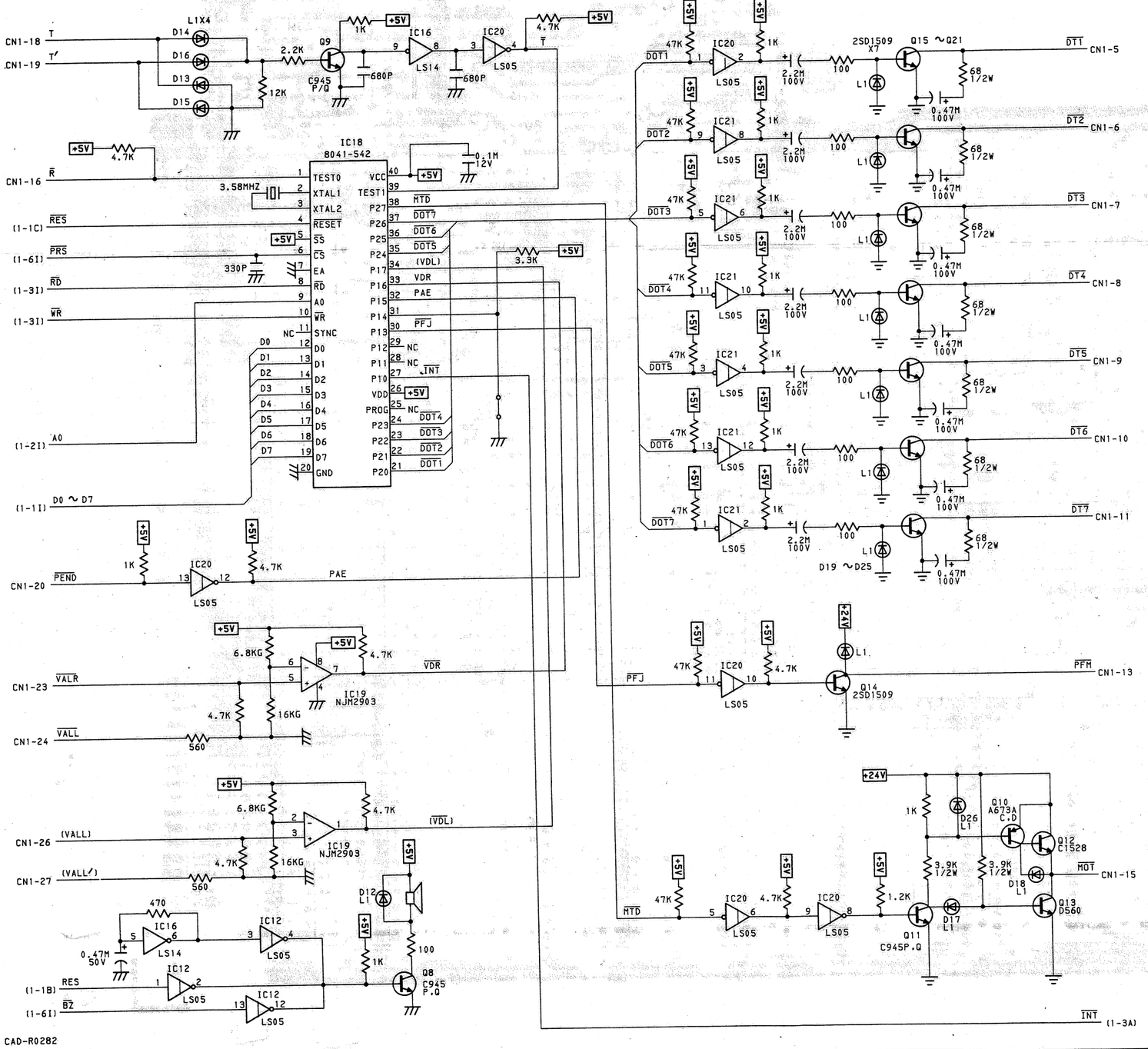
### Main P.W.B. circuit-1

BOARD CODE : N2635RC



## Main P.W.B. circuit-2

BOARD CODE : N2635RC




CN3

| NO | SIGNAL |
|---|---|
| 1 | ▼ |
| 2 | COM |
| 3 | G13 |
| 4 | G12 |
| 5 | G11 |
| 6 | G10 |
| 7 | G9 |
| 8 | G8 |
| 9 | G7 |
| 10 | DP |
| 11 | G6 |
| 12 | G5 |
| 13 | G4 |
| 14 | G3 |
| 15 | G2 |
| 16 | G1 |
| 17 | GND-P |
| 18 | +36V |
| 19 | D0 |
| 20 | SGS |
| 21 | D3 |
| 22 | GND |
| 23 | +5V |
| 24 | D1 |
| 25 | D2 |
| 26 | D4 |
| 27 | D7 |
| 28 | D5 |
| 29 | D6 |
| 30 | VF1 |
| 31 | VF2 |

CN1

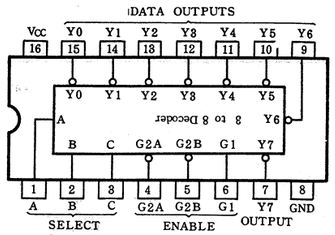
| NO | SIGNAL |
|---|---|
| 1 | +24V |
| 2 | +24V |
| 3 | +24V |
| 4 | +24V |
| 5 | DT1 |
| 6 | DT2 |
| 7 | DT3 |
| 8 | DT4 |
| 9 | DT5 |
| 10 | DT6 |
| 11 | DT7 |
| 12 | NC |
| 13 | PFM |
| 14 | NC |
| 15 | MOT |
| 16 | R |
| 17 | GND |
| 18 | T |
| 19 | T' |
| 20 | PEND |
| 21 | GND |
| 22 | +5V |
| 23 | VALR |
| 24 | VALL |
| 25 | +5V |
| 26 | VALL |
| 27 | VALL' |
| 28 | +5V |

CN2

| NO | SIGNAL |
|---|---|
| 1 | KS0 |
| 2 | KS1 |
| 3 | KS2 |
| 4 | KS3 |
| 5 | KS4 |
| 6 | KS5 |
| 7 | KS6 |
| 8 | KR0 |
| 9 | KR1 |
| 10 | KR2 |
| 11 | KR3 |
| 12 | KR4 |
| 13 | KR5 |
| 14 | KR7 |

## 7-4. Main PWB layout

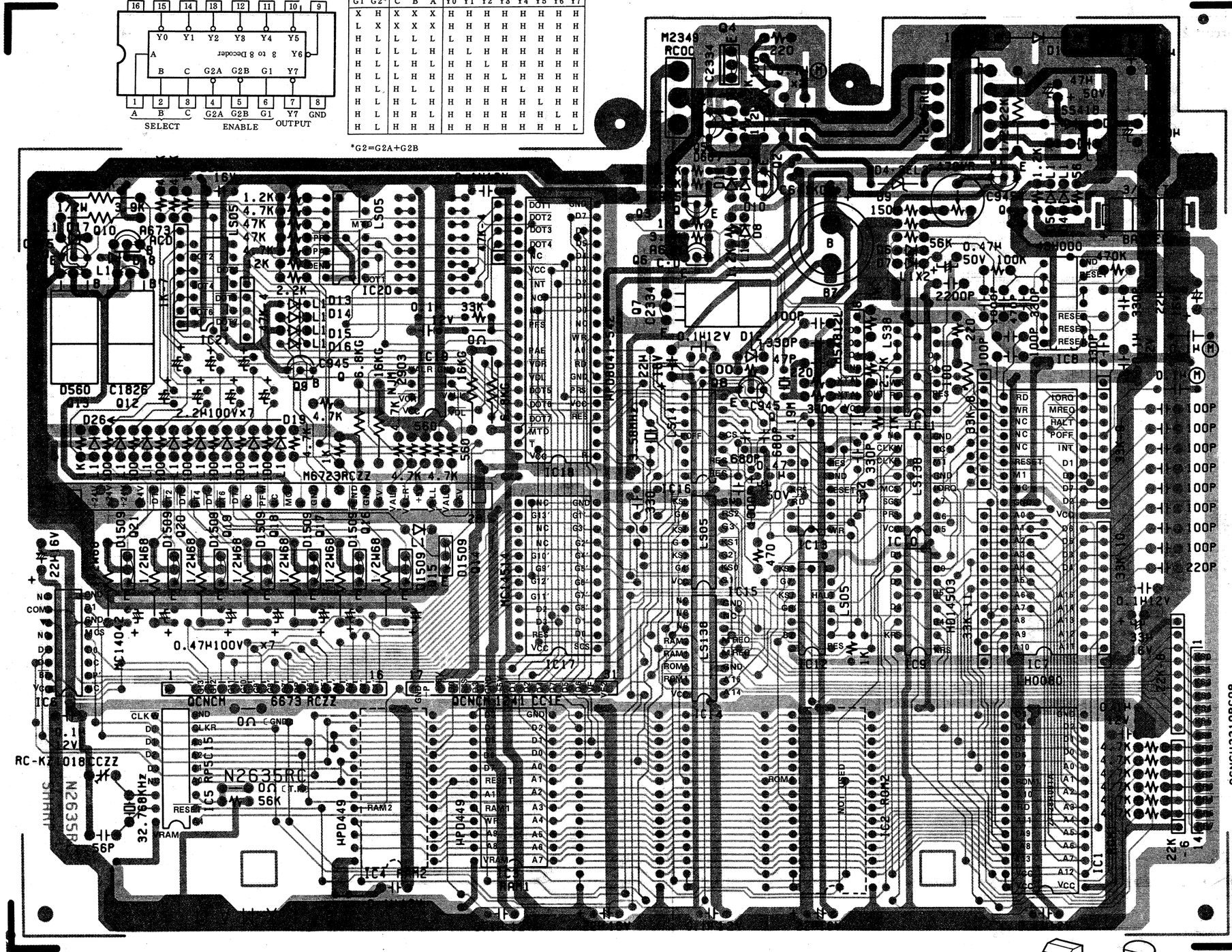
④ 74LS138 (3−8 Decoder)


DATA OUTPUTS
Vcc Y0 Y1 Y2 Y3 Y4 Y5 Y6
16 15 14 13 12 11 10 9
Y0 Y1 Y2 Y3 Y4 Y5
A
8 to 8 Decoder
B C G2A G2B G1 Y7
1 2 3 4 5 6 7 8
A B C G2A G2B G1 Y7 GND
SELECT
ENABLE
OUTPUT

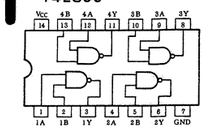
74LS138

| INPUTS | | | | | OUTPUTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENABLE | | SELECT | | | | | | | | | | |
| G1 | G2* | C | B | A | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| X | H | X | X | X | H | H | H | H | H | H | H | H |
| L | X | X | X | X | H | H | H | H | H | H | H | H |
| H | L | L | L | L | L | H | H | H | H | H | H | H |
| H | L | L | L | H | H | L | H | H | H | H | H | H |
| H | L | L | H | L | H | H | L | H | H | H | H | H |
| H | L | L | H | H | H | H | H | L | H | H | H | H |
| H | L | H | L | L | H | H | H | H | L | H | H | H |
| H | L | H | L | H | H | H | H | H | H | L | H | H |
| H | L | H | H | L | H | H | H | H | H | H | L | H |
| H | L | H | H | H | H | H | H | H | H | H | H | L |

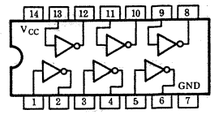
*G2=G2A+G2B



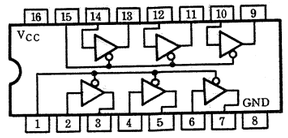

① TC40H000P
74LS00



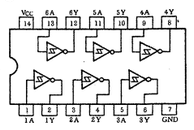

② 74LS05
74LS04
TC40H004



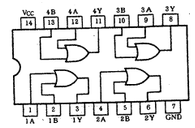

③ HD14503(MC14503)



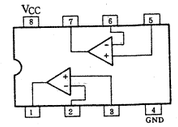

⑤ 74LS14



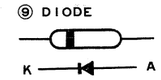

⑦ 74LS32




⑥ NJM2903

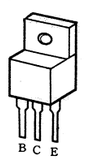



⑨ DIODE

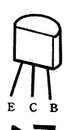



1S1834
1SS41B
1S1588L1

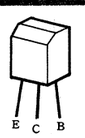
⑧ TRNSISTOR



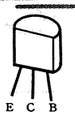

2SD1826
2SC560
2SC2334




2SD667
2SC641
2SC1472
2SC945



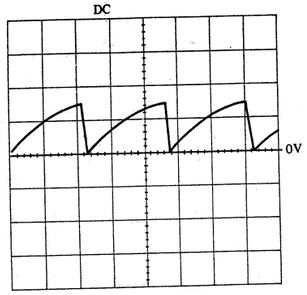

2SA673



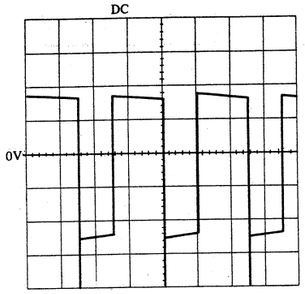

2SC1472
2SC945

## 7-5. Power supply circuit

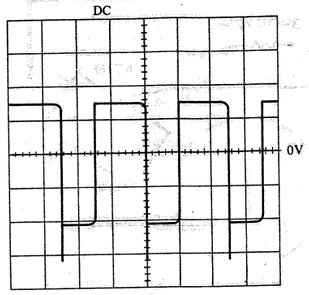
③ 20μS 50mV auto + int chl DC



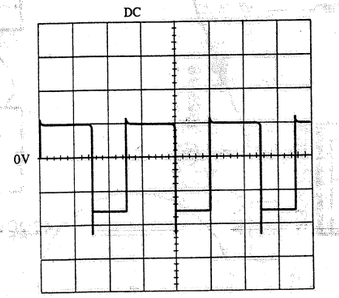

④ 20μS 2V auto + int chl DC



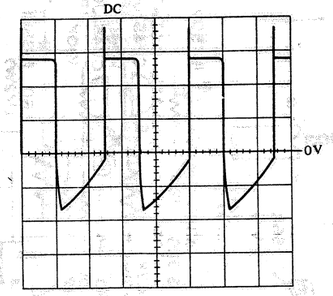

⑤ 20μS 0.5V auto + int chl DC



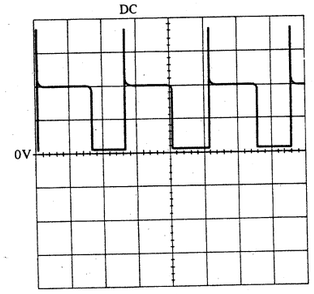

⑥ 20μS 0.5V auto + int chl DC




⑦ 20μS 50mV auto + int chl DC

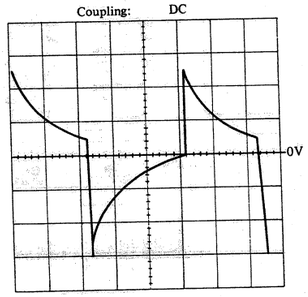


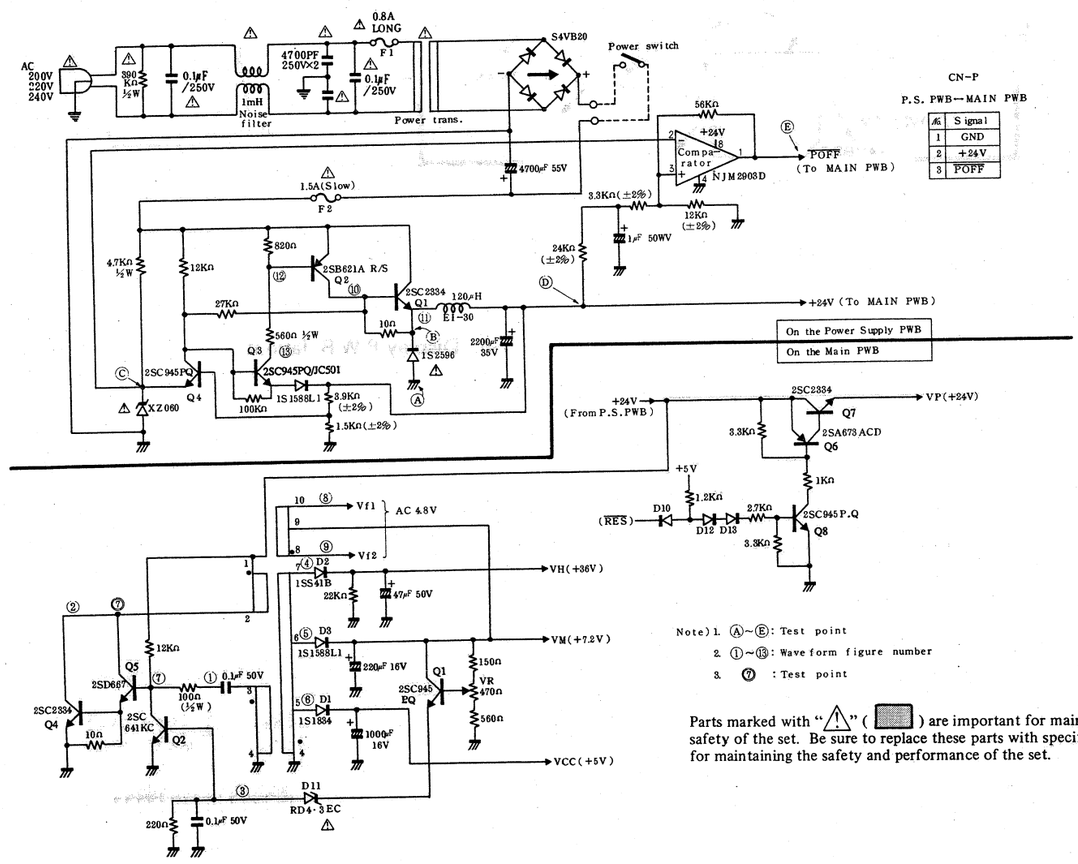

② 20μS 2V auto + int chl DC




Scope Settings

① Time Base: 10μS
Voltage x 10: 0.5V
Trigger Mode: auto
Trigger slope: +
Trigger Source: int chl
Coupling: DC

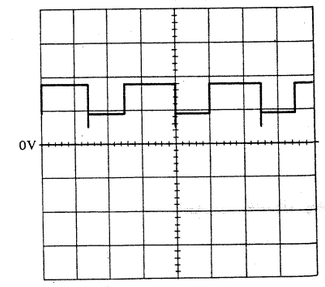


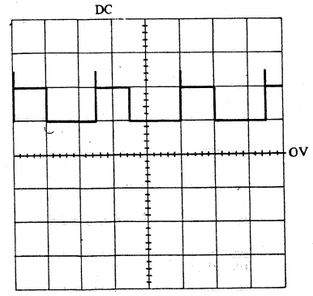

Note) 1. Ⓐ~Ⓔ: Test point
2. ①~⑬: Wave form figure number
3. ⑦ : Test point

Parts marked with "⚠" ( ▭ ) are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

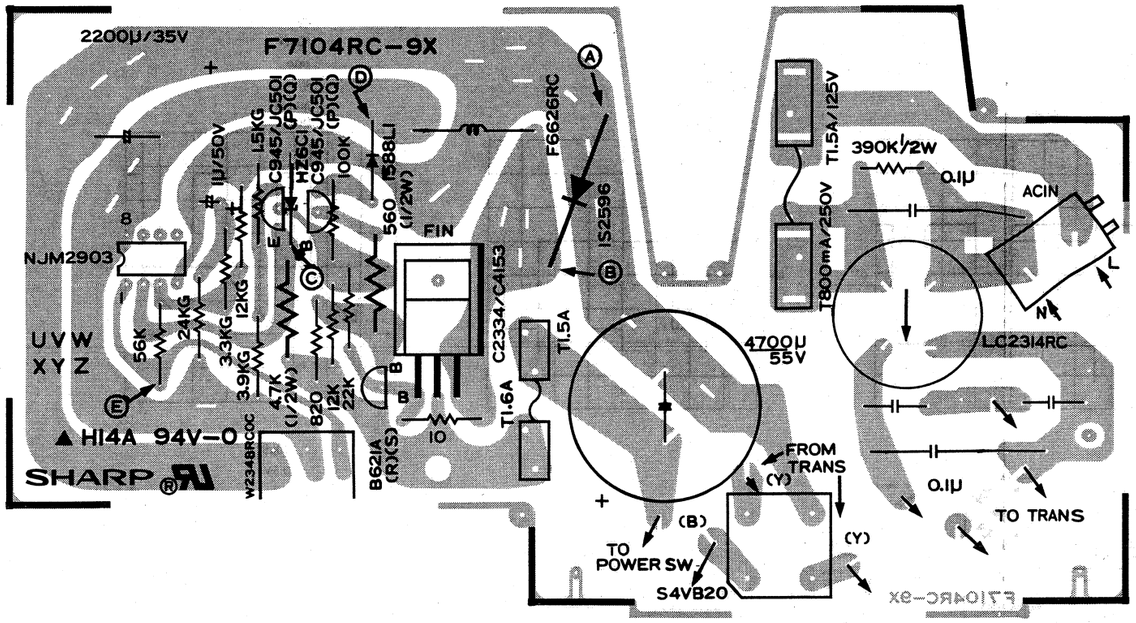
⑧ 20μS 0.5V auto + int chl



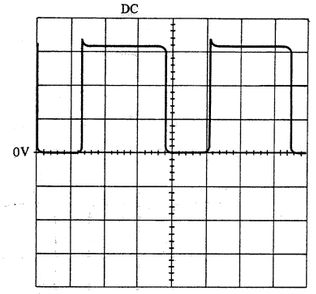

⑨ 20μS 0.5V auto int chl DC



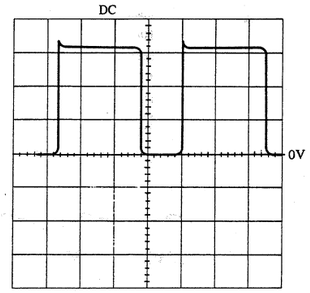
## 7-6. Power supply P.W.B. layout



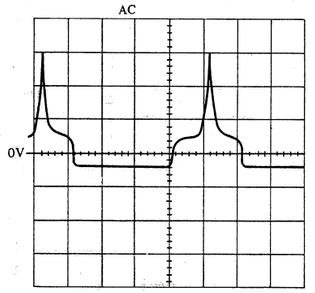

⑩
5μS
1V
norm
int chl
DC



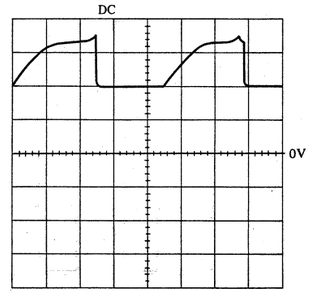

⑪
5μS
1V
norm
int chl
DC



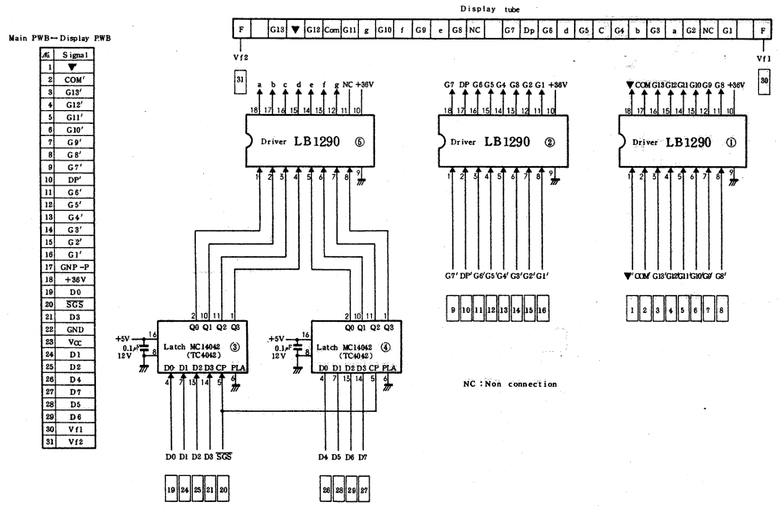

⑫
2μS
0.1V
norm
int chl
AC



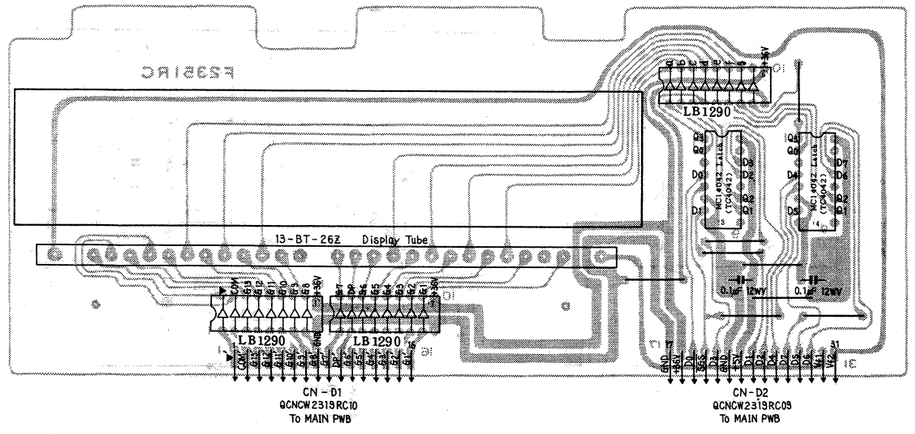

⑬
5μS
0.5V
norm
int chl
DC




## 7-7. Display drive circuit

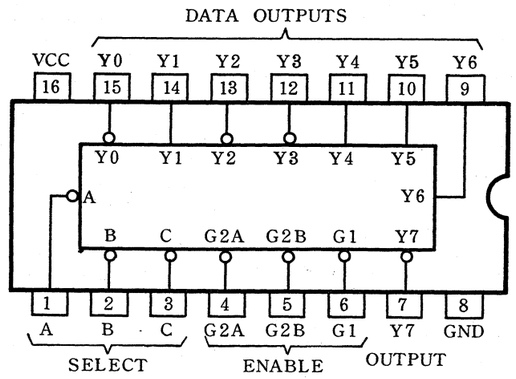



## 7-8. Display P.W.B. layout



## 7-9. IC Internal logic

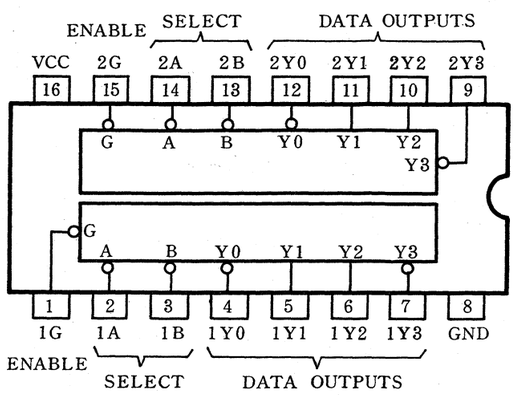
### 74LS138 (3-8 Decoder)


DATA OUTPUTS
VCC Y0 Y1 Y2 Y3 Y4 Y5 Y6
16 15 14 13 12 11 10 9
Y0 Y1 Y2 Y3 Y4 Y5
A Y6
B C G2A G2B G1 Y7
1 2 3 4 5 6 7 8
A B C G2A G2B G1 Y7 GND
SELECT ENABLE OUTPUT

TRUTH TABLE OF 74LS138

| INPUTS | | | | OUTPUTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ENABLE | | SELECT | | | | | | | | | |
| G1 | G2 | C | B | A | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| X | H | X | X | X | H | H | H | H | H | H | H | H |
| L | X | X | X | X | H | H | H | H | H | H | H | H |
| H | L | L | L | L | L | H | H | H | H | H | H | H |
| H | L | L | L | H | H | L | H | H | H | H | H | H |
| H | L | L | H | L | H | H | L | H | H | H | H | H |
| H | L | L | H | H | H | H | H | L | H | H | H | H |
| H | L | H | L | L | H | H | H | H | L | H | H | H |
| H | L | H | L | H | H | H | H | H | H | L | H | H |
| H | L | H | H | L | H | H | H | H | H | H | L | H |
| H | L | H | H | H | H | H | H | H | H | H | H | L |

### 74LS139 (Dual 2-4 Decoder)

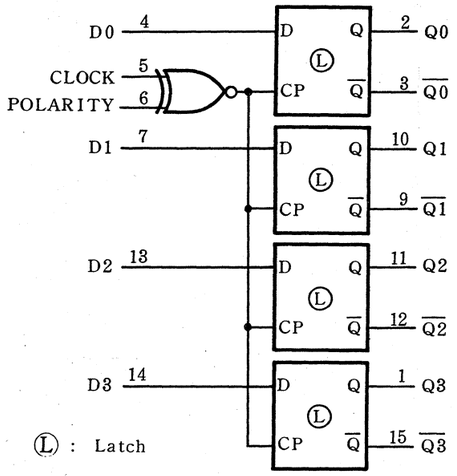

ENABLE SELECT DATA OUTPUTS
VCC 2G 2A 2B 2Y0 2Y1 2Y2 2Y3
16 15 14 13 12 11 10 9
G A B Y0 Y1 Y2
Y3
G
A B Y0 Y1 Y2 Y3
1 2 3 4 5 6 7 8
1G 1A 1B 1Y0 1Y1 1Y2 1Y3 GND
ENABLE SELECT DATA OUTPUTS

TRUTH TABLE OF 74LS139

| INPUTS | | | OUTPUTS | | | |
|---|---|---|---|---|---|---|
| ENABLE | SELECT | | | | | |
| G | B | A | Y0 | Y1 | Y2 | Y3 |
| H | X | X | H | H | H | H |
| L | L | L | L | H | H | H |
| L | L | H | H | L | H | H |
| L | H | L | H | H | L | H |
| L | H | H | H | H | H | L |

### MC14042 (TC4042) 4-Bit Latch

BLOCK DIAGRAM




TRUTH TABLE OF MC14042

| INPUTS | | OUTPUT |
|---|---|---|
| CLOCK | POLARITY | Qn |
| H | H | Dn |
| L | L | Dn |
| ↑ | L | LATCH |
| ↓ | H | LATCH |

# SHARP PARTS GUIDE

## MODEL BE-2520

CONTENTS


1 Cabinet and Key unit

2 Printer, PWB etc.

3 Packing material & Accessories

4 Main PWB unit

5 Power supply unit

6 Display PWB unit

7 Articles of consumptions

■ Index

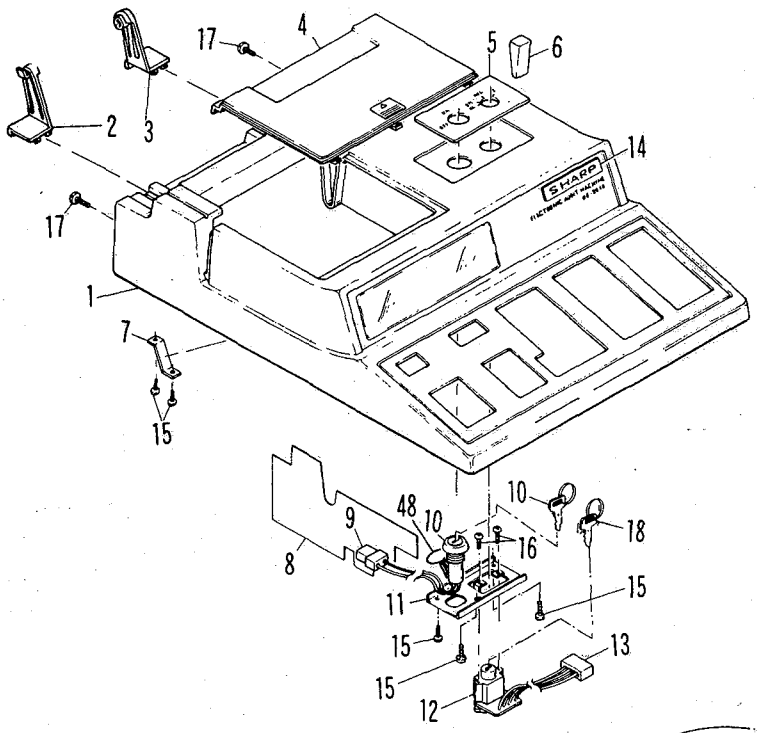

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

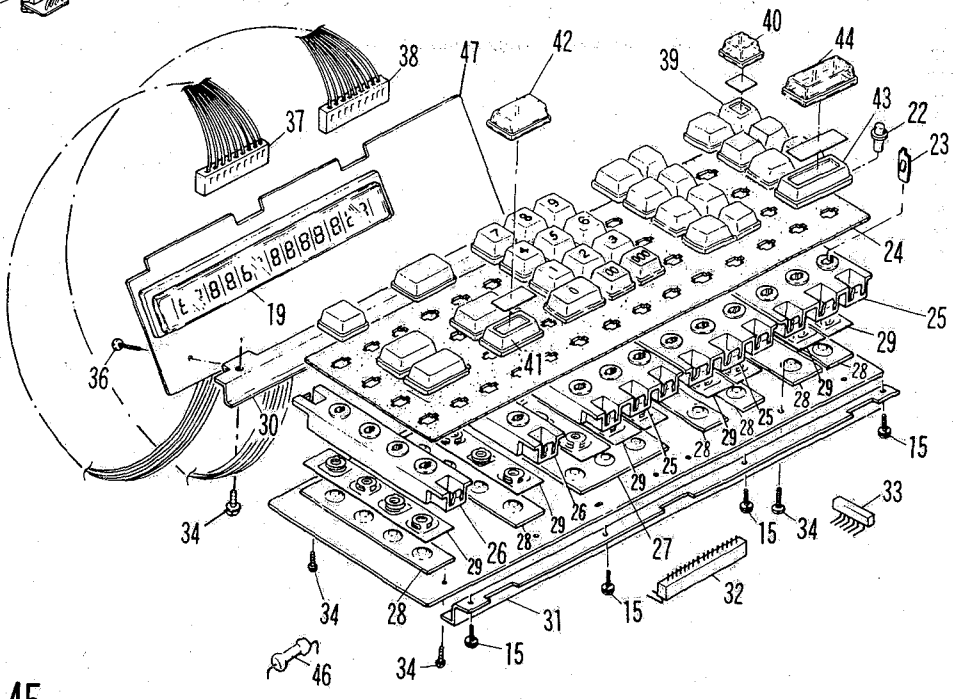
**BE2520V**

## 1 Cabinet and Key unit

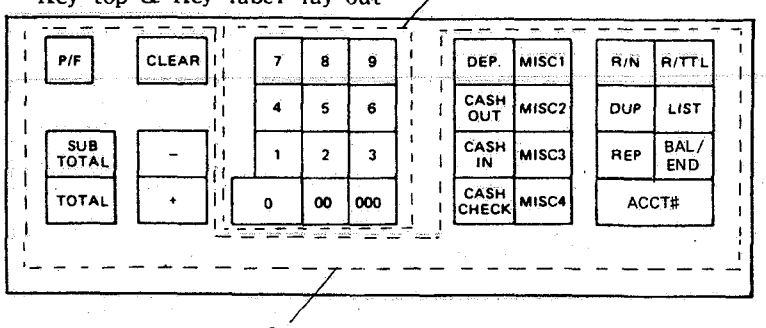
| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | CCABB7038RC01 | BC | N | D | Top cabinet |
| 2 | LHLDZ6790RCZZ | AD | N | C | Paper holder (Left) |
| 3 | LHLDZ6789RCZZ | AD | N | C | Paper holder (Right) |
| 4 | CCOVP6931RC01 | AN | N | C | Printer cover unit |
| 5 | HDECB6779RCZZ | AK | N | C | Key switch panel |
| 6 | PGUMM2314RCZZ | AE | | C | Rubber stopper |
| 7 | LANGK2346RCZZ | AC | | C | Filter fitting angle |
| 8 | GCOVH2329RCZZ | AF | | C | PS PWB barrier |
| 9 | QCNCW2336RC05 | AD | | B | Connector (2pin with wires) |
| 10 | QSW-Z2006WCZZ | AV | | B | Power switch (Switch+key) |
| 11 | LANGK2342RCZZ | AE | | C | Switch angle |
| 12 | LKGiW2330RCZZ | AX | | B | Mode switch body |
| 13 | QCNCW2319RC07 | AF | | C | Connector (5pin with wires) |
| 14 | HBDGA2315RCZZ | AF | | D | SHARP badge (MZ1P04) |
| 15 | XUPSD30P06000 | AA | | C | Screw (3×6) |
| 16 | XBSSD26P06000 | AA | | C | Screw (2.6×6) |
| 17 | XBSSC30P10000 | AA | | C | Screw (3×10) |
| 18 | LKGiM2331RCZZ | AH | | B | OP key (2PCS/Set) |
| | LKGiM2332RCZZ | AH | | B | MA key (2PCS/Set) |
| 19 | VVDH13-BT-26Z | BB | | B | Display tube (DH13-BT-26Z) |
| 20 | CLABH2353RCZZ | AN | | C | Key label unit |
| 22 | LPiNS1002CCZZ | AA | | C | Key guide |
| 23 | MLEVP6671RCZZ | AA | | C | Key lever |
| 24 | PFLT-2315RCZZ | AC | | C | Key felt |
| 25 | LFRM-1006CCZZ | AD | | C | Key frame for 12key (for 12key) |
| 26 | LFRM-1007CCZZ | AC | | C | Key frame (for 4key) |
| 27 | PGUMM1043CCZZ | AH | | B | Key rubber (for 12key) |
| 28 | PGUMM1041CCZZ | AE | | B | Key rubber (for 4key) |
| 29 | MSPRP1090CCZZ | AC | | C | Key spring (for 4key) |
| 30 | LANGT2343RCZZ | AF | | C | PWB fitting angle |
| 31 | LANGT2344RCZZ | AD | | C | Key fitting angle |
| 32 | QCNCM2350RC1D | AF | | C | Connector (14pin) |
| 33 | QCNCM2350RC0G | AD | | C | Connector (7pin) |
| 34 | XBPSD30P05K00 | AA | | C | Screw (3×5K) |
| 36 | XBPSD30P06KS0 | AA | | C | Screw (3×6KS) |
| 37 | QCNCW2319RC10 | AP | | C | Connector (16pin) |
| 38 | QCNCW2319RC09 | AN | | C | Connector (15pin) |
| 39 | JKNBZ6381RCZZ | AC | | C | Key top blank (1×1) |
| 40 | JKNBZ6382RCZZ | AC | | C | Key cap (1×1) |
| 41 | JKNBZ6383RCZZ | AD | | C | Key top blank (1×1.5) |
| 42 | JKNBZ6384RCZZ | AD | | C | Key cap (1×1.5) |
| 43 | JKNBZ6385RCZZ | AD | | C | Key top blank (1×2) |
| 44 | JKNBZ6386RCZZ | AD | | C | Key cap (1×2) |
| 45 | JKNBZ6670RCZZ | AB | | C | Key top 1 (1×1) |
| | JKNBZ6671RCZZ | AB | | C | Key top 2 (1×1) |
| | JKNBZ6672RCZZ | AB | | C | Key top 3 (1×1) |
| | JKNBZ6673RCZZ | AB | | C | Key top 4 (1×1) |
| | JKNBZ6674RCZZ | AB | | C | Key top 5 (1×1) |
| | JKNBZ6675RCZZ | AB | | C | Key top 6 (1×1) |
| | JKNBZ6676RCZZ | AB | | C | Key top 7 (1×1) |
| | JKNBZ6677RCZZ | AB | | C | Key top 8 (1×1) |
| | JKNBZ6678RCZZ | AB | | C | Key top 9 (1×1) |
| | JKNBZ6681RCZZ | AC | | C | Key top 0 (1×1.5) |
| | JKNBZ6682RCZZ | AB | | C | Key top 00 (1×1) |
| | JKNBZ2314RCZZ | AB | | C | Key top 000 (1×1) |
| 46 | VHDDS1588L1-1 | AD | | B | Diode (DS1588L1) |
| 47 | CPWBF2351RC01 | BQ | | E | Display PWB unit (Include No.19,37,38) |
| 48 | VCFYSU2JA473K | AC | | C | Capacitor (630WV 0.047μF) |
| 501 | CPWBF2353RC10 | BW | N | E | Key unit (Include No.20~29,32,33,39~46) |

## 1 Cabinet and Key unit



Key top & Key label lay out



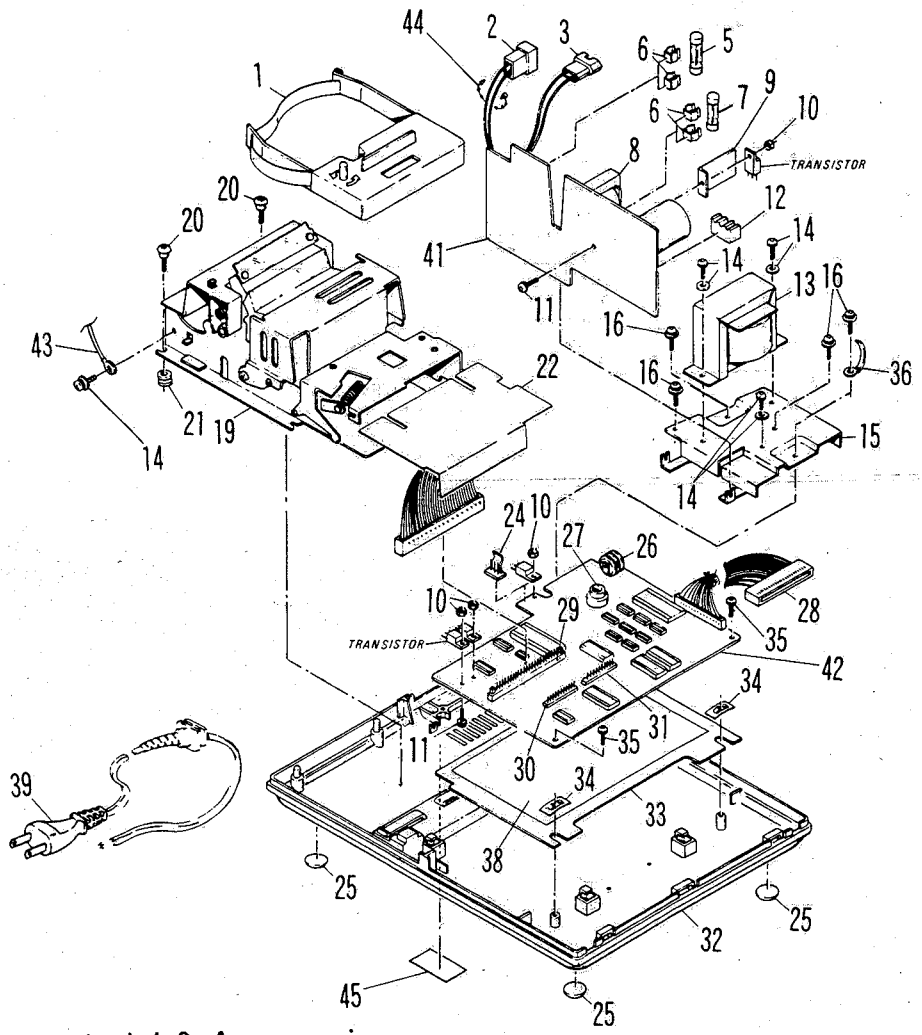
## 2 Printer,PWB etc.

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | PRBN-2314RCZZ | AX | | S | Ink ribbon |
| 2 | QCNCW2348RC0C | AD | | B | Connector (3pin) |
| 3 | QCNCM2335RC02 | AD | | B | Connector (2pin) |
| ⚠ 5 | QFS-C1021CCZZ | AF | | A | Fuse (0.8A/250V) |
| 6 | QFSHA1002CCZZ | AB | | C | Holder,fuse(SN-3E) (MINI TYPE) |
| ⚠ 7 | QFS-C1035CCZZ | AE | | A | Fuse (1.6A 250V) |
| 8 | RTRNH2325RCZZ | AS | | B | Converter transformer |
| 9 | PRDAF6628RCZZ | AB | | C | Heat sink (for Transistor) |
| 10 | XNESD30-24000 | AA | | C | Nut (3NS) |
| 11 | XBPSD30P10000 | AA | | C | Screw (3×10) |
| 12 | QCNCW2348RC0C | AD | | B | Connector (3pin) |
| ⚠ 13 | RTRNP6812RCZZ | AY | | B | Power transformer |
| 14 | XBPSD40P08KS0 | AA | | C | Screw (4×8KS) |
| 15 | LCHSS2318RCZZ | AH | | C | PS chassis |
| 16 | XBPSD30P06KS0 | AA | | C | Screw (3×6KS) |
| 19 | Ki-OB2328RCZZ | CH | | E | Printer (M210V) |
| 20 | LX-BZ1007CCZZ | AB | | C | Screw (3×10KS) |
| 21 | PCUS-4101CCZZ | AB | | C | Printer cushion |
| 22 | GCOVP2330RCZZ | AD | | C | Printer cover |
| 24 | QCNCM2349RC0C | AC | | B | Connector (3pin) |
| 25 | GLEGP1005CCZZ | AB | | C | Rubber foot (SJ5012) |
| 26 | UBATN2173CCZZ | AT | | B | Battery |
| 27 | RALMB1002CCZZ | AN | | B | Alarm |
| 28 | QCNCW2319RC08 | AM | | C | Connector (8pin) |
| 29 | QCNCM6723RCZZ | AM | | C | Connector (28pin) |
| 30 | QCNCM6673RCZZ | AE | | C | Connector (16pin) |
| 31 | QCNCM1241CC1E | AE | | C | Connector (15pin) |
| 32 | GCABA7025RCZZ | AZ | N | D | Bottom cabinet |
| 33 | LANGK2347RCZZ | AK | | C | Angle |
| 34 | LX-NZ6651RCZZ | AA | | C | Nut |
| 35 | XUPSD30P06000 | AA | | C | Screw (3×6) |
| 36 | LHLDW0135FCZZ | AA | | C | Wire holder (WH-1) |
| 38 | PSHEF2315RCZZ | AF | | C | Insulator sheet |
| ⚠ 39 | QACCE1422QCZZ | AP | | B | AC cord |
| 41 | CPWBF7104RC01 | BS | N | E | Power supply PWB unit (Include No.2~7,9,12) |
| 42 | CPWBN2635RC01 | CG | | E | Main PWB unit (Include No.8,24,26~31) |
| 43 | QCNW-7258RCZZ | AC | N | C | Earth wire |
| 44 | LBNDJ0004UCZZ | AA | | C | Cable band (TE10K) |
| 45 | TCAUS6668RCZZ | AA | N | D | Caution label |

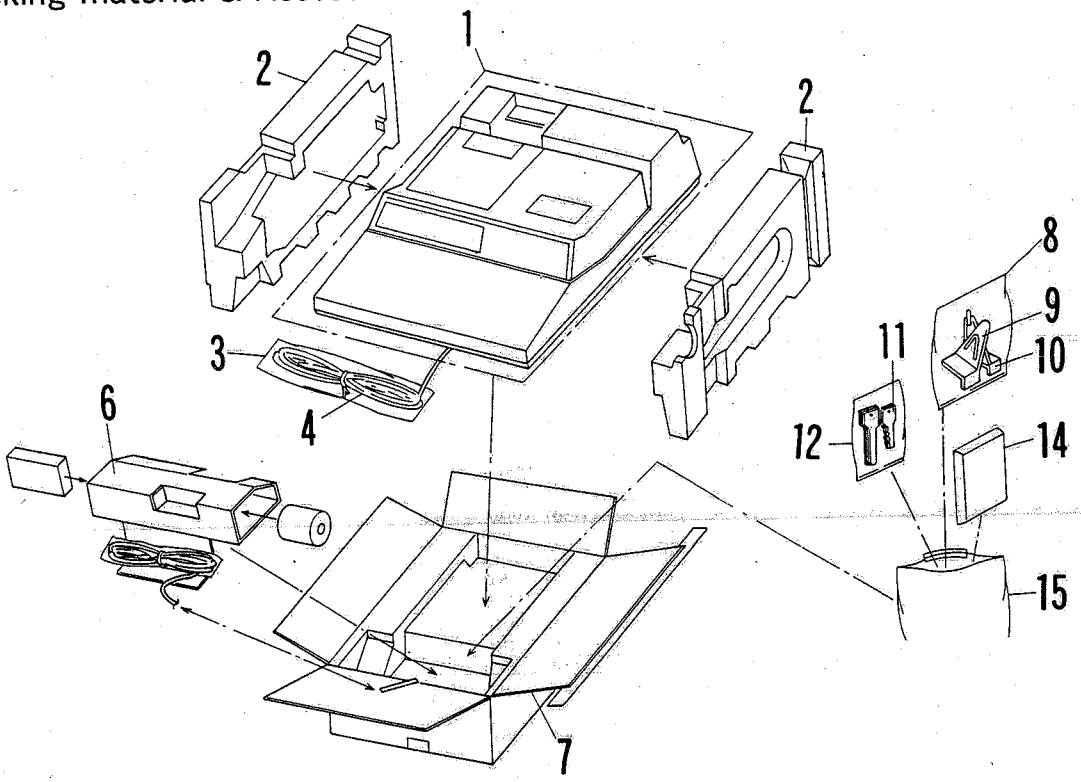
## 3 Packing material & Accessories

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | SSAKA0006WCZZ | AB | | D | Vinyl bag (400×500mm) |
| 2 | SPAKA2345RCZZ | AL | | D | Packing cushion |
| 3 | SSAKA5004CCZZ | AA | | D | Vinyl bag (100×300mm) |
| 4 | UBNDA1008CCZZ | AA | | C | AC cord band (120mm) |
| 6 | SPAKF2349RCZZ | AD | | D | Attachment |
| 7 | SPAKC2699RCZZ | AK | | D | Packing case |
| 8 | SSAKA1130QCZZ | AA | | D | Vinyl bag (100×120mm) |
| 9 | LHLDZ6789RCZZ | AD | N | C | Paper holder (Right) |
| 10 | LHLDZ6790RCZZ | AD | N | C | Paper holder (Left) |
| 11 | LKGiM2331RCZZ | AH | | B | OP key (2PCS/Set) |
| | LKGiM2332RCZZ | AH | | B | MA key (2PCS/Set) |
| 12 | SSAKA2011KCZZ | AA | | D | Vinyl bag (60×100mm) |
| 14 | GCOVD2331RCZZ | AQ | | D | Dust cover |
| 15 | SSAKH3015CCZZ | AA | | D | Vinyl bag (240×360mm) |

## [2] Printer,PWB etc.




## [3] Packing material & Accessories



## 4 Main PWB unit

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | QCNCM1241CC1E | AE | | C | Connector (15pin) |
| 2 | QCNCW2319RC08 | AM | | C | Connector (8pin) |
| 3 | QCNCM2349RC0C | AC | | B | Connector (3pin) |
| 4 | QCNCM6673RCZZ | AE | | C | Connector (16pin) |
| 5 | QCNCM6723RCZZ | AM | | C | Connector (28pin) |
| 6 | RALMB1002CCZZ | AN | | B | Alarm |
| 7 | RC-KZ1018CCZZ | AE | | C | Capacitor (250WV 25pF) |
| 8 | RC-Z1N104RCZZ | AA | | C | Capacitor |
| 9 | RCRSP1003CCZZ | AT | | B | Crystal (32.768KHz) |
| 10 | RCRSP2314RCZZ | AK | | B | Crystal (3.58MHz) |
| 11 | RCRSP2316RCZZ | AK | | B | Crystal (4.19MHz) |
| 12 | RMPTCA333QCKB | AD | | B | Block resistor (33KΩ 1/8W ±10%) |
| 13 | RMPTC0333QCKB | AD | | B | Block resistor (33KΩ×10 1/8W ±10%) |
| 14 | RMPTC4473QCKB | AC | | B | Block resistor (47KΩ×4 1/8W ±10%) |
| 15 | RMPTC6223QCKB | AC | | B | Block resistor (22KΩ×6 1/8W ±10%) |
| 16 | RMPTC7102QCKB | AC | | B | Block resistor (1KΩ×7 1/8W ±10%) |
| 17 | RMPTC8223QCKB | AD | | B | Block resistor (22KΩ×8 1/8W ±10%) |
| 18 | RMPTC8333QCKB | AD | | B | Block risistor (33KΩ×8 1/8W ±10%) |
| 19 | RMPTC9333QCKB | AC | | B | Block resistor (33KΩ×9 1/16W ±10%) |
| 20 | RTRNH2325RCZZ | AS | | B | Converter transformer |
| 21 | RVR-MD221QCZZ | AD | | B | Variable resistor (470Ω SR19R-470) |
| 22 | UBATN2173CCZZ | AT | | B | Battery |
| 23 | VCCCPU1HH470J | AA | | C | Capacitor (50WV 47PF) |
| 24 | VCCCPU1HH560J | AA | | C | Capacitor (50WV 56pF) |
| 25 | VCEAGU1CW108M | AD | | C | Capacitor (16WV 1000μF) |
| 26 | VCEAGU1CW226M | AA | | C | Capacitor (16WV 22μF) |
| 27 | VCEAGU1CW227M | AB | | C | Capacitor (16WV 220μF) |
| 28 | VCEAGU1CW336M | AA | | C | Capacitor (16WV 33μF) |
| 29 | VCEAGU1HW474M | AA | | C | Capacitor (50WV 0.47μF) |
| 30 | VCEAGU1HW476M | AB | | C | Capacitor (50WV 47μF) |
| 31 | VCEAGU2AW225M | AB | | C | Capacitor (100WV 2.2μF) |
| 32 | VCEAGU2AW474M | AB | | C | Capacitor (100WV 0.47μF) |
| 33 | VCEAGA1CW226MT | AA | | C | Capacitor (16WV 22μF) |
| 34 | VCKYPU1HB101K | AA | | C | Capacitor (50WV 100pF) |
| 35 | VCKYPU1HB102K | AA | | C | Capacitor (50WV 1000pF) |
| 36 | VCKYPU1HB221K | AB | | C | Capacitor (50WV 220pF) |
| 37 | VCKYPU1HB222K | AA | | C | Capacitor (50WV 2200pF) |
| 38 | VCKYPU1HB331K | AA | | C | Capacitor (50WV 330pF) |
| 39 | VCKYPU1HB471K | AA | | C | Capacitor (50WV 470pF) |
| 40 | VCKYPA1HB681K | AA | | C | Capacitor (50WV 680pF) |
| 41 | VCQYKU1HM104K | AB | | C | Capacitor (50WV 0.10μF) |
| 42 | VHDDS1588L1-1 | AD | | B | Diode (DS1588L1) |
| 43 | VHD1SS41B//-1 | AB | | B | Diode (1SS41B) |
| 44 | VHD1S1834//-1 | AE | | B | Diode (1S1834) |
| 45 | VHERD4.3EL3-1 | AB | | B | Zener diode (RD4.3EL3) |
| 46 | VHiHD14503B-1 | AH | | B | IC (HD14503B) |
| 47 | VHiLC3518BL15 | AP | | B | IC (LC3518BL15) |
| 48 | VHiLH0080//-1 | AW | | B | IC (LH0080) |
| 49 | VHiMC14042B-1 | AM | | B | IC (MC14042B) |
| 50 | VHiMC14514B-1 | AS | | B | IC (MC14514B) |
| 51 | VHiM54812L/-1 | AP | | B | IC (M54812L) |
| 52 | VHiNJM2903N-1 | AH | | B | IC (NJM2903N) |
| 53 | VHiRP5C15//-1 | AV | | B | IC (RP5C15) |
| 54 | VHiSN74LS14-1 | AM | | B | IC (SN74LS14) |
| 55 | VHiTC40H000P1 | AF | | B | IC (TC40H000P) |
| 56 | VHiT74LS05/-C | AD | | B | IC (T74LS05) |
| 57 | VHiT74LS138-C | AF | | B | IC (T74LS138) |
| 58 | VHiT74LS32/-C | AE | | B | IC (T74LS32) |
| 59 | VHiT74LS38/-C | AE | | B | IC (T74LS38) |
| 60 | VHiUPD8041542 | BG | | B | L.S.I (UPD8041542) |
| 61 | VHi27128R091A | BN | | B | IC (VHI27128R091A) |
| 62 | VRD-HT2EY163G | AA | | C | Resistor (1/4W 16KΩ ±2%) |
| 63 | VRD-HT2EY682G | AA | | C | Resistor (1/4W 6.8KΩ ±2%) |
| 64 | VRD-HT2HY101J | AA | | C | Resistor (1/2W 100Ω ±5%) |
| 65 | VRD-HT2HY223J | AA | | C | Resistor (1/2W 22KΩ ±5%) |
| 66 | VRD-HT2HY392J | AA | | C | Resistor (1/2W 3.9KΩ ±5%) |
| 67 | VRD-HT2HY680J | AA | | C | Resistor (1/2W 68Ω ±5%) |
| 68 | VRD-RC2EY100J | AA | | C | Resistor (1/4W 10Ω ±5%) |
| 69 | VRD-RC2EY101J | AA | | C | Resistor (1/4W 100Ω ±5%) |
| 70 | VRD-RC2EY102J | AA | | C | Resistor (1/4W 1.0KΩ ±5%) |
| 71 | VRD-RC2EY104J | AA | | C | Resistor (1/4W 100KΩ ±5%) |
| 72 | VRD-RC2EY122J | AA | | C | Resistor (1/4W 1.2KΩ ±5%) |
| 73 | VRD-RC2EY123J | AA | | C | Resistor (1/4W 12KΩ ±5%) |
| 74 | VRD-RC2EY151J | AA | | C | Resistor (1/4W 150Ω ±5%) |
| 75 | VRD-RC2EY221J | AA | | C | Resistor (1/4W 220Ω ±5%) |
| 76 | VRD-RC2EY222J | AA | | C | Resistor (1/4W 2.2KΩ ±5%) |
| 77 | VRD-RC2EY272J | AA | | C | Resistor (1/4W 2.7KΩ ±5%) |
| 78 | VRD-RC2EY331J | AA | | C | Resistor (1/4W 330Ω ±5%) |
| 79 | VRD-RC2EY332J | AA | | C | Resistor (1/4W 3.3KΩ ±5%) |
| 80 | VRD-RC2EY333J | AA | | C | Resistor (1/4W 33KΩ ±5%) |

## 4 Main PWB unit

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 81 | VRD-RC2EY471J | AA | | C | Resistor (1/4W 470Ω ±5%) |
| 82 | VRD-RC2EY472J | AA | | C | Resistor (1/4W 4.7KΩ ±5%) |
| 83 | VRD-RC2EY473J | AA | | C | Resistor (1/4W 47KΩ ±5%) |
| 84 | VRD-RC2EY474J | AA | | C | Resistor (1/4W 470KΩ ±5%) |
| 85 | VRD-RC2EY560J | AA | | C | Resistor (1/4W 56Ω ±5%) |
| 86 | VRD-RC2EY561J | AA | | C | Resistor (1/4W 560Ω ±5%) |
| 87 | VRD-RC2EY563J | AA | | C | Resistor (1/4W 56KΩ ±5%) |
| 88 | VRD-ST2EY000J | AA | | C | Resistor (1/4W 0Ω ±5%) |
| 89 | VS2SA673AC/DC | AD | | B | Transistor (2SA673AC) |
| 90 | VS2SC1826-RGC | AE | | B | Transistor (2SC1826-RGC) |
| 91 | VS2SC2334-/-1 | AL | | B | Transistor (2SC2334) |
| 92 | VS2SC641KC/-1 | AE | | B | Transistor (2SC641KC) |
| 93 | VS2SC945-Q/-1 | AB | | B | Transistor (2SC945-Q) |
| 94 | VS2SD1195-/-1 | AH | | B | Transistor (2SD1195) |
| 95 | VS2SD1509-/-1 | AF | | B | Transistor (2SD1509) |
| 96 | VS2SD667-//-1 | AD | | B | Transistor (2SD667) |
| 97 | XBPSD30P08K00 | AA | | C | Screw (3×8K) |
| 98 | XNESD30-24000 | AA | | C | Nut (3NS) |
| | (Unit) | | | | |
| 901 | CPWBN2635RC01 | CG | | E | Main PWB unit |

## 5 Power supply unit

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | LBNDJ0004UCZZ | AA | | C | Cable band (TE10K) |
| 2 | PCOVP6633RCZZ | AB | | C | Fuse cap(TUV reguration) for F1 |
| 3 | PRDAF6628RCZZ | AB | | C | Heat sink (for Transistor) |
| 4 | QCNCM2335RC02 | AD | | B | Connector (2pin) |
| 5 | QCNCW2348RC0C | AD | | B | Connector (3pin) |
| ⚠ 6 | QFS-C1035CCZZ | AE | | A | Fuse (1.6A 250V) |
| ⚠ 7 | QFS-C1021CCZZ | AF | | A | Fuse (0.8A/250V) |
| 8 | QFSHA1002CCZZ | AB | | C | Holder;fuse(SN-3E) (MINI TYPE) |
| 9 | QTANN6630RCZZ | AF | | C | Terminal |
| 10 | RC-FZ6626RCZZ | AE | | C | Capacitor (35WV 2200μF) |
| 11 | RC-FZ6633RCZZ | AP | | C | Capacitor (55WV 4700μF) |
| 12 | RCiLC2314RCZZ | AK | | C | Line filter (1050μH) |
| 13 | RCiLF6626RCZZ | AN | | C | Coil |
| 14 | VCEAGU1HW105M | AA | | C | Capacitor (50WV 1.0μF) |
| 15 | VCE9HE2EP104K | AK | | C | Capacitor (0.1μF 250WV) |
| 16 | VHDDS1588L1-1 | AD | | B | Diode (DS1588L1) |
| 17 | VHDS4VB20//-1 | AL | | B | Diode (S4VB20) |
| 18 | VHD1S2596//-1 | AG | | B | Diode (1S2596) |
| 19 | VHEHZ6C1///-1 | AB | | B | Zener diode (HZ6C1) |
| 20 | VHiNJM2903N-1 | AH | | B | IC (NJM2903N) |
| 21 | VRD-HT2EY100J | AA | | C | Resistor (1/4W 10Ω ±5%) |
| 22 | VRD-HT2EY104J | AA | | C | Resistor (1/4W 100KΩ ±5%) |
| 23 | VRD-HT2EY123G | AA | | C | Resistor (1/4W 12KΩ ±2%) |
| 24 | VRD-HT2EY123J | AA | | C | Resistor (1/4W 12KΩ ±5%) |
| 25 | VRD-HT2EY152G | AA | | C | Resistor (1/4W 1.5KΩ ±2%) |
| 26 | VRD-HT2EY223J | AA | | C | Resistor (1/4W 22KΩ ±5%) |
| 27 | VRD-HT2EY243G | AA | | C | Resistor (1/4W 24KΩ ±2%) |
| 28 | VRD-HT2EY332G | AA | | C | Resistor (1/4W 3.3KΩ ±2%) |
| 29 | VRD-HT2EY392G | AA | | C | Resistor (1/4W 3.9KΩ ±2%) |
| 30 | VRD-HT2EY563J | AA | | C | Resistor (1/4W 56KΩ ±5%) |
| 31 | VRD-HT2EY821J | AA | | C | Resistor (1/4W 820Ω ±5%) |
| 32 | VRD-HT2HY394J | AA | | C | Resistor (1/2W 390KΩ ±5%) |
| 33 | VRD-HT2HY472J | AA | | C | Resistor (1/2W 4.7KΩ ±5%) |
| 34 | VRD-HT2HY561J | AA | | C | Resistor (1/2W 560Ω ±5%) |
| 35 | VS2SB621AR/SC | AD | | B | Transistor (2SB621) |
| 36 | VS2SC2334-/-1 | AL | | B | Transistor (2SC2334) |
| 37 | VS2SC945-P/QC | AC | | B | Transistor (2SC945Q) |
| 38 | XBPSD30P10000 | AA | | C | Screw (3×10) |
| 39 | XNESD30-24000 | AA | | C | Nut (3NS) |
| | (Unit) | | | | |
| 901 | CPWBF7104RC01 | BS | N | E | Power supply PWB unit |

## 6 Display PWB unit

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | QCNCW2319RC09 | AN | | C | Connector (15pin) |
| 2 | QCNCW2319RC10 | AP | | C | Connector (16pin) |
| 3 | RC-Z1N104RCZU | AB | | C | Capacitor (12WV 0.10μF) |

## 6 Display PWB unit

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 4 | VHiLB1290//-1 | AM | | B | IC (LB1290) |
| 5 | VHiMC14042B-1 | AM | | B | IC (MC14042B) |
| 6 | VVDH13-BT-26Z | BB | | B | Display tube (DH13-BT-26Z) |
| | (Unit) | | | | |
| 901 | CPWBF2351RC01 | BQ | | E | Display PWB unit |

## 7 Articles of consumptions

| NO. | PARTS CODE | PRICE RANK | NEW MARK | PART RANK | DESCRIPTION |
|---|---|---|---|---|---|
| 1 | DPAPR1041CSZZ | AZ | | S | Roll paper (5PCS) |
| 2 | DPAPR1042CSZZ | AT | | S | Roll paper (5PCS) |
| 3 | PRBN-2314RCZZ | AX | | S | Ink ribbon |

## Index

| PARTS CODE | NO. | PRICE RANK | NEW MARK | PART RANK | |
|---|---|---|---|---|---|
| 〔C〕 | | | | | |
| CCABB7038RC01 | 1- 1 | BC | N | D | |
| CCŌVP6931RC01 | 1- 4 | AN | N | C | |
| CLABH2353RCZZ | 1- 20 | AN | | C | |
| CPWBF2351RC01 | 1- 47 | BQ | | E | |
| 〃 | 6- 901 | BQ | | E | |
| CPWBF2353RC10 | 1- 501 | BW | N | E | |
| CPWBF7104RC01 | 2- 41 | BS | N | E | |
| 〃 | 5- 901 | BS | N | E | |
| CPWBN2635RC01 | 2- 42 | CG | | E | |
| 〃 | 4- 901 | CG | | E | |
| 〔D〕 | | | | | |
| DPAPR1041CSZZ | 7- 1 | AZ | | S | |
| DPAPR1042CSZZ | 7- 2 | AT | | S | |
| 〔G〕 | | | | | |
| GCABA7025RCZZ | 2- 32 | AZ | N | D | |
| GCŌVD2331RCZZ | 3- 14 | AQ | | D | |
| GCŌVH2329RCZZ | 1- 8 | AF | | C | |
| GCŌVP2330RCZZ | 2- 22 | AD | | C | |
| GLEGP1005CCZZ | 2- 25 | AB | | C | |
| 〔H〕 | | | | | |
| HBDGA2315RCZZ | 1- 14 | AF | | D | |
| HDECB6779RCZZ | 1- 5 | AK | N | C | |
| 〔J〕 | | | | | |
| JKNBZ2314RCZZ | 1- 45 | AB | | C | |
| JKNBZ6381RCZZ | 1- 39 | AC | | C | |
| JKNBZ6382RCZZ | 1- 40 | AC | | C | |
| JKNBZ6383RCZZ | 1- 41 | AD | | C | |
| JKNBZ6384RCZZ | 1- 42 | AD | | C | |
| JKNBZ6385RCZZ | 1- 43 | AD | | C | |
| JKNBZ6386RCZZ | 1- 44 | AD | | C | |
| JKNBZ6670RCZZ | 1- 45 | AB | | C | |
| JKNBZ6671RCZZ | 1- 45 | AB | | C | |
| JKNBZ6672RCZZ | 1- 45 | AB | | C | |
| JKNBZ6673RCZZ | 1- 45 | AB | | C | |
| JKNBZ6674RCZZ | 1- 45 | AB | | C | |
| JKNBZ6675RCZZ | 1- 45 | AB | | C | |
| JKNBZ6676RCZZ | 1- 45 | AB | | C | |
| JKNBZ6677RCZZ | 1- 45 | AB | | C | |
| JKNBZ6678RCZZ | 1- 45 | AB | | C | |
| JKNBZ6681RCZZ | 1- 45 | AC | | C | |
| JKNBZ6682RCZZ | 1- 45 | AB | | C | |
| 〔K〕 | | | | | |
| Ki-ŌB2328RCZZ | 2- 19 | CH | | E | |
| 〔L〕 | | | | | |
| LANGK2342RCZZ | 1- 11 | AE | | C | |
| LANGK2346RCZZ | 1- 7 | AC | | C | |
| LANGK2347RCZZ | 2- 33 | AK | | C | |
| LANGT2343RCZZ | 1- 30 | AF | | C | |
| LANGT2344RCZZ | 1- 31 | AD | | C | |
| LBNDJ0004UCZZ | 2- 44 | AA | | C | |
| 〃 | 5- 1 | AA | | C | |
| LCHSS2318RCZZ | 2- 15 | AH | | C | |
| LFRM-1006CCZZ | 1- 25 | AD | | C | |
| LFRM-1007CCZZ | 1- 26 | AC | | C | |
| LHLDW0135FCZZ | 2- 36 | AA | | C | |
| LHLDZ6789RCZZ | 1- 3 | AD | N | C | |
| 〃 | 3- 9 | AD | N | C | |
| LHLDZ6790RCZZ | 1- 2 | AD | N | C | |
| 〃 | 3- 10 | AD | N | C | |
| LKGiM2331RCZZ | 1- 18 | AH | | B | |
| 〃 | 3- 11 | AH | | B | |
| LKGiM2332RCZZ | 1- 18 | AH | | B | |
| 〃 | 3- 11 | AH | | B | |
| LKGiW2330RCZZ | 1- 12 | AX | | B | |
| LPiNS1002CCZZ | 1- 22 | AA | | C | |
| LX-BZ1007CCZZ | 2- 20 | AB | | C | |
| LX-NZ6651RCZZ | 2- 34 | AA | | C | |
| 〔M〕 | | | | | |
| MLEVP6671RCZZ | 1- 23 | AA | | C | |
| MSPRP1090CCZZ | 1- 29 | AC | | C | |
| 〔P〕 | | | | | |
| PCŌVP6633RCZZ | 5- 2 | AB | | C | |
| PCUS-4101CCZZ | 2- 21 | AB | | C | |
| PFLT-2315RCZZ | 1- 24 | AC | | C | |
| PGUMM1041CCZZ | 1- 28 | AE | | B | |
| PGUMM1043CCZZ | 1- 27 | AH | | B | |
| PGUMM2314RCZZ | 1- 6 | AE | | C | |
| PRBN-2314RCZZ | 2- 1 | AX | | S | |
| 〃 | 7- 3 | AX | | S | |

| PARTS CODE | NO. | PRICE RANK | NEW MARK | PART RANK | |
|---|---|---|---|---|---|
| PRDAF6628RCZZ | 2- 9 | AB | | C | |
| 〃 | 5- 3 | AB | | C | |
| PSHEF2315RCZZ | 2- 38 | AF | | C | |
| 〔Q〕 | | | | | |
| QACCE1422QCZZ | 2- 39 | AP | | B | |
| QCNCM1241CC1E | 2- 31 | AE | | C | |
| 〃 | 4- 1 | AE | | C | |
| QCNCM2335RC02 | 2- 3 | AD | | B | |
| 〃 | 5- 4 | AD | | B | |
| QCNCM2349RC0C | 2- 24 | AC | | B | |
| 〃 | 4- 3 | AC | | B | |
| QCNCM2350RC0G | 1- 33 | AD | | C | |
| QCNCM2350RC1D | 1- 32 | AF | | C | |
| QCNCM6673RCZZ | 2- 30 | AE | | C | |
| 〃 | 4- 4 | AE | | C | |
| QCNCM6723RCZZ | 2- 29 | AM | | C | |
| 〃 | 4- 5 | AM | | C | |
| QCNCW2319RC07 | 1- 13 | AF | | C | |
| QCNCW2319RC08 | 2- 28 | AM | | C | |
| 〃 | 4- 2 | AM | | C | |
| QCNCW2319RC09 | 1- 38 | AN | | C | |
| 〃 | 6- 1 | AN | | C | |
| QCNCW2319RC10 | 1- 37 | AP | | C | |
| 〃 | 6- 2 | AP | | C | |
| QCNCW2336RC05 | 1- 9 | AD | | B | |
| QCNCW2348RC0C | 2- 2 | AD | | B | |
| 〃 | 2- 12 | AD | | B | |
| 〃 | 5- 5 | AD | | B | |
| QCNW-7258RCZZ | 2- 43 | AC | N | C | |
| QFS-C1021CCZZ | 2- 5 | AF | | A | |
| 〃 | 5- 7 | AF | | A | |
| QFS-C1035CCZZ | 2- 7 | AE | | A | |
| 〃 | 5- 6 | AE | | A | |
| QFSHA1002CCZZ | 2- 6 | AB | | C | |
| 〃 | 5- 8 | AB | | C | |
| QSW-Z2006WCZZ | 1- 10 | AV | | B | |
| QTANN6630RCZZ | 5- 9 | AF | | C | |
| 〔R〕 | | | | | |
| RALMB1002CCZZ | 2- 27 | AN | | B | |
| 〃 | 4- 6 | AN | | B | |
| RC-FZ6626RCZZ | 5- 10 | AE | | C | |
| RC-FZ6633RCZZ | 5- 11 | AP | | C | |
| RC-KZ1018CCZZ | 4- 7 | AE | | C | |
| RC-Z1N104RCZU | 6- 3 | AB | | C | |
| RC-Z1N104RCZZ | 4- 8 | AA | | C | |
| RCiLC2314RCZZ | 5- 12 | AK | | C | |
| RCiLF6626RCZZ | 5- 13 | AN | | C | |
| RCRSP1003CCZZ | 4- 9 | AT | | B | |
| RCRSP2314RCZZ | 4- 10 | AK | | B | |
| RCRSP2316RCZZ | 4- 11 | AK | | B | |
| RMPTCA333QCKB | 4- 12 | AD | | B | |
| RMPTC0333QCKB | 4- 13 | AD | | B | |
| RMPTC4473QCKB | 4- 14 | AC | | B | |
| RMPTC6223QCKB | 4- 15 | AC | | B | |
| RMPTC7102QCKB | 4- 16 | AC | | B | |
| RMPTC8223QCKB | 4- 17 | AD | | B | |
| RMPTC8333QCKB | 4- 18 | AD | | B | |
| RMPTC9333QCKB | 4- 19 | AC | | B | |
| RTRNH2325RCZZ | 2- 8 | AS | | B | |
| 〃 | 4- 20 | AS | | B | |
| RTRNP6812RCZZ | 2- 13 | AY | | B | |
| RVR-MD221QCZZ | 4- 21 | AD | | B | |
| 〔S〕 | | | | | |
| SPAKA2345RCZZ | 3- 2 | AL | | D | |
| SPAKC2699RCZZ | 3- 7 | AK | | D | |
| SPAKF2349RCZZ | 3- 6 | AD | | D | |
| SSAKA0006WCZZ | 3- 1 | AB | | D | |
| SSAKA1130QCZZ | 3- 8 | AA | | D | |
| SSAKA2011KCZZ | 3- 12 | AA | | D | |
| SSAKA5004CCZZ | 3- 3 | AA | | D | |
| SSAKH3015CCZZ | 3- 15 | AA | | D | |
| 〔T〕 | | | | | |
| TCAUS6668RCZZ | 2- 45 | AA | N | D | |
| 〔U〕 | | | | | |
| UBATN2173CCZZ | 2- 26 | AT | | B | |
| 〃 | 4- 22 | AT | | B | |
| UBNDA1008CCZZ | 3- 4 | AA | | C | |
| 〔V〕 | | | | | |
| VCCCPU1HH470J | 4- 23 | AA | | C | |
| VCCCPU1HH560J | 4- 24 | AA | | C | |

| PARTS CODE | NO. | PRICE RANK | NEW MARK | PART RANK | |
|---|---|---|---|---|---|
| VCEAGA1CW226MT | 4- 33 | AA | | C | |
| VCEAGU1CW108M | 4- 25 | AD | | C | |
| VCEAGU1CW226M | 4- 26 | AA | | C | |
| VCEAGU1CW227M | 4- 27 | AB | | C | |
| VCEAGU1CW336M | 4- 28 | AA | | C | |
| VCEAGU1HW105M | 5- 14 | AA | | C | |
| VCEAGU1HW474M | 4- 29 | AA | | C | |
| VCEAGU1HW476M | 4- 30 | AB | | C | |
| VCEAGU2AW225M | 4- 31 | AB | | C | |
| VCEAGU2AW474M | 4- 32 | AB | | C | |
| VCE9HE2EP104K | 5- 15 | AK | | C | |
| VCFYSU2JA473K | 1- 48 | AC | | C | |
| VCKYPA1HB681K | 4- 40 | AA | | C | |
| VCKYPU1HB101K | 4- 34 | AA | | C | |
| VCKYPU1HB102K | 4- 35 | AA | | C | |
| VCKYPU1HB221K | 4- 36 | AB | | C | |
| VCKYPU1HB222K | 4- 37 | AA | | C | |
| VCKYPU1HB331K | 4- 38 | AA | | C | |
| VCKYPU1HB471K | 4- 39 | AA | | C | |
| VCQYKU1HM104K | 4- 41 | AB | | C | |
| VHDDS1588L1-1 | 1- 46 | AD | | B | |
| 〃 | 4- 42 | AD | | B | |
| 〃 | 5- 16 | AD | | B | |
| VHDS4VB20//-1 | 5- 17 | AL | | B | |
| VHD1SS41B//-1 | 4- 43 | AB | | B | |
| VHD1S1834//-1 | 4- 44 | AE | | B | |
| VHD1S2596//-1 | 5- 18 | AG | | B | |
| VHEHZ6C1///-1 | 5- 19 | AB | | B | |
| VHERD4.3EL3-1 | 4- 45 | AB | | B | |
| VHiHD14503B-1 | 4- 46 | AH | | B | |
| VHiLB1290//-1 | 6- 4 | AM | | B | |
| VHiLC3518BL15 | 4- 47 | AP | | B | |
| VHiLH0080//-1 | 4- 48 | AW | | B | |
| VHiMC14042B-1 | 4- 49 | AM | | B | |
| 〃 | 6- 5 | AM | | B | |
| VHiMC14514B-1 | 4- 50 | AS | | B | |
| VHiM54812L/-1 | 4- 51 | AP | | B | |
| VHiNJM2903N-1 | 4- 52 | AH | | B | |
| 〃 | 5- 20 | AH | | B | |
| VHiRP5C15//-1 | 4- 53 | AV | | B | |
| VHiSN74LS14-1 | 4- 54 | AM | | B | |
| VHiTC40H000P1 | 4- 55 | AF | | B | |
| VHiT74LS05/-C | 4- 56 | AD | | B | |
| VHiT74LS138-C | 4- 57 | AF | | B | |
| VHiT74LS32/-C | 4- 58 | AE | | B | |
| VHiT74LS38/-C | 4- 59 | AE | | B | |
| VHiUPD8041542 | 4- 60 | BG | | B | |
| VHi27128R091A | 4- 61 | BN | | B | |
| VRD-HT2EY100J | 5- 21 | AA | | C | |
| VRD-HT2EY104J | 5- 22 | AA | | C | |
| VRD-HT2EY123G | 5- 23 | AA | | C | |
| VRD-HT2EY123J | 5- 24 | AA | | C | |
| VRD-HT2EY152G | 5- 25 | AA | | C | |
| VRD-HT2EY163G | 4- 62 | AA | | C | |
| VRD-HT2EY223J | 5- 26 | AA | | C | |
| VRD-HT2EY243G | 5- 27 | AA | | C | |
| VRD-HT2EY332G | 5- 28 | AA | | C | |
| VRD-HT2EY392G | 5- 29 | AA | | C | |
| VRD-HT2EY563J | 5- 30 | AA | | C | |
| VRD-HT2EY682G | 4- 63 | AA | | C | |
| VRD-HT2EY821J | 5- 31 | AA | | C | |
| VRD-HT2HY101J | 4- 64 | AA | | C | |
| VRD-HT2HY223J | 4- 65 | AA | | C | |
| VRD-HT2HY392J | 4- 66 | AA | | C | |
| VRD-HT2HY394J | 5- 32 | AA | | C | |
| VRD-HT2HY472J | 5- 33 | AA | | C | |
| VRD-HT2HY561J | 5- 34 | AA | | C | |
| VRD-HT2HY680J | 4- 67 | AA | | C | |
| VRD-RC2EY100J | 4- 68 | AA | | C | |
| VRD-RC2EY101J | 4- 69 | AA | | C | |
| VRD-RC2EY102J | 4- 70 | AA | | C | |
| VRD-RC2EY104J | 4- 71 | AA | | C | |
| VRD-RC2EY122J | 4- 72 | AA | | C | |
| VRD-RC2EY123J | 4- 73 | AA | | C | |
| VRD-RC2EY151J | 4- 74 | AA | | C | |
| VRD-RC2EY221J | 4- 75 | AA | | C | |
| VRD-RC2EY222J | 4- 76 | AA | | C | |
| VRD-RC2EY272J | 4- 77 | AA | | C | |
| VRD-RC2EY331J | 4- 78 | AA | | C | |
| VRD-RC2EY332J | 4- 79 | AA | | C | |

| PARTS CODE | NO. | PRICE RANK | NEW MARK | PART RANK | |
|---|---|---|---|---|---|
| VRD-RC2EY333J | 4- 80 | AA | | C | |
| VRD-RC2EY471J | 4- 81 | AA | | C | |
| VRD-RC2EY472J | 4- 82 | AA | | C | |
| VRD-RC2EY473J | 4- 83 | AA | | C | |
| VRD-RC2EY474J | 4- 84 | AA | | C | |
| VRD-RC2EY560J | 4- 85 | AA | | C | |
| VRD-RC2EY561J | 4- 86 | AA | | C | |
| VRD-RC2EY563J | 4- 87 | AA | | C | |
| VRD-ST2EY000J | 4- 88 | AA | | C | |
| VS2SA673AC/DC | 4- 89 | AD | | B | |
| VS2SB621AR/SC | 5- 35 | AD | | B | |
| VS2SC1826-RGC | 4- 90 | AE | | B | |
| VS2SC2334-/-1 | 4- 91 | AL | | B | |
| 〃 | 5- 36 | AL | | B | |
| VS2SC641KC/-1 | 4- 92 | AE | | B | |
| VS2SC945-P/QC | 5- 37 | AC | | B | |
| VS2SC945-Q/-1 | 4- 93 | AB | | B | |
| VS2SD1195-/-1 | 4- 94 | AH | | B | |
| VS2SD1509-/-1 | 4- 95 | AF | | B | |
| VS2SD667-//-1 | 4- 96 | AD | | B | |
| VVDH13-BT-26Z | 1- 19 | BB | | B | |
| 〃 | 6- 6 | BB | | B | |
| [X] | | | | | |
| XBPSD30P05K00 | 1- 34 | AA | | C | |
| XBPSD30P06KS0 | 1- 36 | AA | | C | |
| 〃 | 2- 16 | AA | | C | |
| XBPSD30P08K00 | 4- 97 | AA | | C | |
| XBPSD30P10000 | 2- 11 | AA | | C | |
| 〃 | 5- 38 | AA | | C | |
| XBPSD40P08KS0 | 2- 14 | AA | | C | |
| XBSSC30P10000 | 1- 17 | AA | | C | |
| XBSSD26P06000 | 1- 16 | AA | | C | |
| XNESD30-24000 | 2- 10 | AA | | C | |
| 〃 | 4- 98 | AA | | C | |
| 〃 | 5- 39 | AA | | C | |
| XUPSD30P06000 | 1- 15 | AA | | C | |
| 〃 | 2- 35 | AA | | C | |